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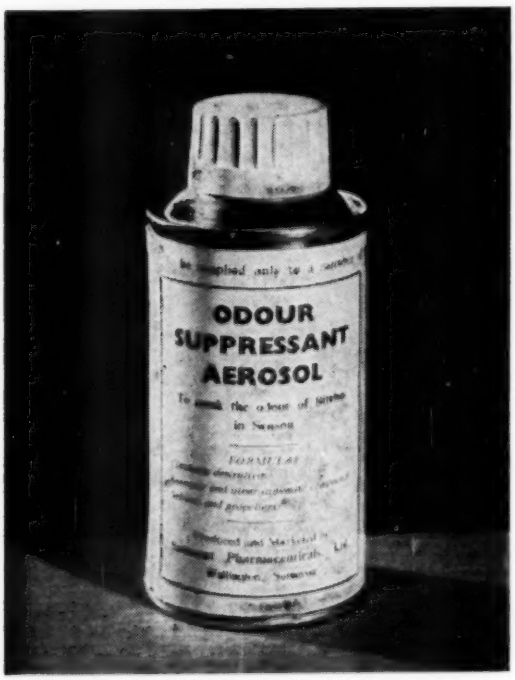

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The Royal Army Veterinary Corps

Readers may remember that, comparatively recently, the future, indeed the very existence, of the Royal Army Veterinary Corps was under scrutiny by the War Office. Perhaps the greatest service rendered by the late Brigadier Ralston to the Corps he commanded, and to our profession, was his conduct of the long and anxious negotiations which led to the triumphant vindication of the Corps' *raison d'être* as an essential element in the modern British Army and thus to its continuance in being. To have achieved this much for a body having so gallant and so distinguished a history is a memorial of which any veterinary surgeon might be proud.

This summer the seal was set upon Ralston's work by the approval of a permanent rank structure for the Corps' Officers, which allows for a Brigadier, a Colonel, 5 Lieutenant-Colonels, and 20 Majors, Captains and Lieutenants—the latter on appointment, and the captaincies after one year's service.

This Establishment, though not large in to-day's almost horseless army, yet calls for a *corps d'elite* of veterinary surgeons skilled in their profession and devoted to their country's interest. It is a challenge to the younger members of the profession who, at a time when practice is lucrative as never before, should still feel it an honour to help maintain a great tradition. For traditions, no matter how well founded, can only survive by the continual infusion of new life, without which they petrify into monuments of a dead past. It is for that reason this leading article is published. We are informed that when National Service ends the Royal Army Veterinary Corps will be fifty per cent. under strength, and empty appointments may be filled with non-qualified officers, leading eventually to the extinction of the Corps through lack of support by the profession.

Such an outcome would be a catastrophe; a wilful indifference to the lives and accomplishments of great men; a failure to distinguish between the larger life of our profession and the selfish life of the individual. We referred in these columns last week to a projected second volume of the history of the Corps covering the past four decades, and the story when it is published will prove to be a worthy one; but it is necessary only to turn the page of Smith's historic first volume to understand what veterinary services in the Army contributed in war and in peace to the community, to the profession as such, and to the art and science of veterinary surgery. The profession to-day must not let the continuation of this service go by default; it must not let itself down, and we hope most earnestly that new graduates, among others, will give serious consideration to offering themselves as commissioned officers in the Corps. There are good prospects for a full, rewarding and interesting career, and, on a purely practical plane, the reputation of the Corps stands so high that those who have served in it are welcome recruits to other branches of the profession when their services become available later in life.

We are living in a period when the veterinarian is in demand as never before. The classified advertisement columns of this journal are sufficient evidence of that. The present boom may prove lasting or it may not: too many factors are involved to make any forecast of what the next decade or two may bring other than hazardous; but with its new Establishment the Royal Army Veterinary Corps offers the dignity and status of commissioned rank in Her Majesty's Army, together with permanency and security. What will be more sympathetic to the minds of veterinary surgeons is that the continuance of its service and tradition is an obligation of honour. That obligation must, and will, be discharged.

Congress Paper read in Plenary Session

Economics of Animal Health*

BY

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Introduction

MOST of us, not being economists or politicians, find it rather difficult to think effectively in terms of hundreds of millions of pounds. Hundreds of pounds have meaning for us, but when dealing with money on a nation-wide basis we have to adapt our thinking to a different scale and adjust our sense of perspective. To convert personal values to national values one has to multiply by the population of the United Kingdom. Last year the hypothetical "average person" spent £20 on tobacco, which means the 50,000,000 people in the United Kingdom spent £1,000,000,000 on this item. They spent about the same on alcoholic drinks.

By a curious coincidence the value of animal products in the United Kingdom is also about £1,000,000,000 a year. Also the capital value of the livestock works out about the same round figure.

I shall try not to confuse you with too many figures and I have rounded off the figures wherever it seemed legitimate to do so. In any case the exact figures vary from year to year and we are only concerned here with the general picture.

The most comprehensive estimates of losses due to disease in farm animals that I have been able to find apply not to this country but to the United States of America. They were issued in 1954 by the Agricultural Research Service of the United States Department of Agriculture and represent the conclusions of a very extensive and detailed enquiry.

These estimates give the total annual losses due to disease in *cattle* as £360,000,000 or about 15 per cent. of the total production. This is an impressive figure on any scale, but to me the most interesting part of this estimate is that only about 1/6th of it is attributed to mortality. In other words, 5/6ths of the loss was due to non-fatal illness. For example, mastitis was estimated to cause a loss of £75,000,000, of which only 1/20th was due to mortality.

The total losses for *pigs* were estimated at £270,000,000 or about 20 per cent. of total production. In this species a higher proportion—about three-quarters—of the loss was attributed to actual mortality. Personally I think that the losses from non-fatal illness in the pig have been underestimated.

In *poultry* the total losses were estimated at £120,000,000 or about 15 per cent. of total production.

More recently, in 1959, the Animal Diseases Eradication Division of the United States Department of Agriculture estimated that the annual losses from disease in all farm livestock in that country were approaching the £1,000,000,000 level.

This gives the broad picture in an advanced Western country : a loss due to all diseases of between 15 and 20 per cent. of total production.

The Organisation for European Economic Co-operation reported in 1952 that losses in livestock in Western Europe were conservatively estimated at about 15 per cent. of livestock production. This figure was arrived at quite independently of the American figure, in fact 2 years before it.

In less well developed parts of the world, such as Africa and Asia, it is well known that losses from disease are very much greater. In these countries until quite recently serious epidemics periodically swept through and decimated the livestock. Such epidemics may be little short of catastrophic in backward countries where cattle are used not only for food but also are the only means of traction on farms. Under such conditions loss of the cattle can result in virtual stoppage of food production.

The recent epidemics of myxomatosis in rabbits were a salutary reminder of how drastic an epidemic can be. The nearest we have seen to this sort of thing lately in farm livestock in the United Kingdom are the outbreaks of fowl pest.

But excellent vaccines are now available and widely used to control diseases such as rinderpest, and vast tracts of land in Africa hitherto unusable by man or his cattle owing to trypanosomes are now being opened up to human habitation for the first time.

Losses in the United Kingdom

Now let us examine the position in this country. The farm animal population of the United Kingdom is approximately 11,000,000 cattle, 27,000,000 sheep, 6,000,000 pigs and 100,000,000 poultry. As I have already said, an approximate estimate of the capital value of this livestock is £1,000,000,000 or £20 for every man, woman and child in the country, and the value of the annual output of animal products is about the same, namely, £1,000,000,000. If we apply the factor of 15 per cent. for losses this gives an annual loss of £150,000,000 from animal diseases in the United Kingdom.

The factor of 15 per cent. is, I think, as reliable as one can reasonably expect in estimates of this sort. It was issued authoritatively for the United States of America in 1954 and for Western Europe in 1952 and I have not seen it challenged. If we make allowances for progress in disease control in the last 6 or 8 years, 15 per cent. might conceivably be on the high side to-day in this country for cattle and sheep, which have received more scientific attention than other farm animals, but I think it is on the low side for pigs and poultry, which have been comparatively neglected. Coles's estimate of £30,000,000 loss from mortality

* Plenary paper presented to the Annual Congress of the British Veterinary Association in Glasgow on Tuesday, August 30th, 1960.

in egg-producing flocks with a gross output of £180,000,000 works out at 17 per cent., and he did not take into account non-fatal disease. For pigs the American figure was 20 per cent., made up largely from actual mortality, so I am sure the total loss for this species is definitely underestimated at 15 per cent.

I feel, therefore, that to put the total yearly cost of disease in the United Kingdom at £150,000,000 is by no means to overstate the case.

Let us look a little more closely at how these losses in the United Kingdom are made up.

The most accurate and reliable figures available are the losses caused by the notifiable diseases. *Foot-and-mouth* disease incidence fluctuates considerably from year to year : 1952 was a bad year, £2,500,000 was paid in compensation (incidentally a small loss compared to the estimated £45,000,000 in France and £40,000,000 in Western Germany for that year) ; in 1956, 1957 and 1958 the compensation paid was just under £1,000,000 each year. *Fowl pest* has assumed even greater importance. In 1956, 1957 and 1958 the compensation paid on account of this disease was about £1,250,000 each year and in 1959 the figure rose to £3,500,000. These are only the amounts paid in compensation : to them must be added the consequential losses to farmers left with unstocked farms and the cost of disposal of carcases, disinfection, veterinary supervision, etc.

Estimates of losses from diseases for which compensation is paid are fairly straightforward. When we come to the non-notifiable diseases and those that are seldom fatal, estimating losses becomes more difficult. The disease in this category about which we have most data is *mastitis in dairy cows.* Lang and Malcolm calculated the loss in the United Kingdom in 1956 at £19,000,000, but this has been criticised as too high, since it was based mainly on data from " problem " herds. In 1959 the Ministry of Agriculture gave the figure of £5,000,000 due to loss of milk, to which must be added loss of stock, veterinary expenses, etc., say another £2,000,000 or £3,000,000. Great advances have been made in the control of mastitis in recent years : only 10 years ago the losses caused by it must have been considerably more. Incidentally, it is interesting to note that now about £1,000,000 a year is spent on antibiotics in the treatment of mastitis in Britain.

Another disease of cattle causing insidious rather than spectacular losses is *tuberculosis.* Although the public health importance of this disease is in itself justification for carrying out a costly eradication scheme, the economic losses caused by the disease also justify such measures. The incidence of the disease in this country as recently as 1946 was estimated at 18 per cent. of all cattle and 30 per cent. of all dairy cows. Economic loss was caused by depressed milk yield in affected cows (£3,000,000), by condemnation of carcases at slaughter (£500,000) and by culling of severe clinical cases (£2,500,000). This amounts to about £6,000,000 annually on the value of the £ 14 years ago, say in round figures roughly £10,000,000 at to-day's value. Furthermore, it has been a common experience that when a herd has been freed from the disease the general health has improved, which suggests that tuberculosis has been responsible for a good deal of illness which had not been attributed to it.

There is no need for me to describe the splendid progress made toward virtual eradication of this disease, which no doubt is well known to you all, but in giving a talk on the economics of animal health I must refer to the financial aspects of the eradication programme. From 1955 to 1957 about £500,000 a year was paid out in compensation for slaughtered animals ; in 1958 and in 1959 the figure rose to the £1,500,000 mark. In addition to these payments, each year for the last 10 years a sum of the order of £10,000,000 has been paid annually as a bonus to attested herds. To these figures must be added the cost of testing and certain other charges. Altogether the total cost of the eradication plan has been about £110,000,000 and it is expected that the figure will reach about £150,000,000 before the project is completed.

We have seen that the saving in better health of cattle is about £10,000,000 a year, so it can be reckoned that the whole cost of eradication will be recouped in 15 years and after that there will be a clear saving of £10,000,000 a year—surely an attractive business proposition, quite apart from the public health aspects.

Another disease where losses are due not so much to mortality as to a reduction in the performance of the animal is *virus pneumonia of pigs.* On Friday there is to be a paper on this disease and you will see that it still eludes precise definition. Our original concept of this disease was a contagious pneumonia of pigs causing a mild clinical disease of long duration and involving mainly the anterior lobes of the lungs. Until the causal agent or agents have been discovered and studied, one cannot say whether there are one or several aetiological entities falling within this definition. In our earlier work it appeared to us that the majority of infectious pneumonias in pigs belonged to one disease entity, which we called virus pneumonia. I still think this view is right, although more recent work has brought to light other forms of pneumonia which can on occasion make diagnosis difficult.

It is now some years since experiments were carried out at Cambridge and Compton which showed that groups of pigs affected with virus pneumonia suffered a depression of growth rate and efficiency of food conversion of the order of 15 to 20 per cent. Since these results were published there has been some argument as to whether it is justifiable to reason that they give an indication of the damaging effect of the disease throughout the country. It may be that the extent of the harmful effect of virus pneumonia varies according to the conditions under which the pigs are kept and possibly with different strains of the causal agent and different secondary infections. In the present state of knowledge, which is admittedly incomplete, I think it reasonable to say that virus pneumonia is an extremely common disease which often causes losses of the order of magnitude indicated by the experiments mentioned. The experience of farmers who have got rid of the disease supports this view. It is, of course, impossible to estimate the losses

with any accuracy but I think a figure like £10,000,000 for this disease is no exaggeration.

Some Surveys of Losses

Let us turn now from individual diseases to some other estimates.

In 1955 Dr. R. Coles conducted an investigation into the incidence of mortality from all causes in poultry. His observations were done on egg-producing flocks and he was not concerned with non-fatal illness. He calculated that the loss amounted to about £30,000,000 a year, about half of which was due to leucosis. It is worth noting that this figure is roughly the same as the Government subsidy on eggs.

There have been several extensive surveys carried out on piglet mortality. These have all shown that about 25 per cent. of all pigs born die before weaning. Official records show that 11,000,000 pigs were slaughtered in 1958–9. This means that even if there were no mortality from weaning to slaughter there must have been 14,000,000 pigs born during the year, so the 25 per cent. piglet mortality represents 3,500,000 pigs. If we value these at £2 each, the loss in the year was £7,000,000. Of course by no means all these deaths in this age group are due to actual disease, many are accidents.

The Animal Health Division of the Ministry of Agriculture started a National Survey of Dairy Herds in October, 1957. This survey should provide valuable information on the incidence of clinical disease in dairy herds and lead to a much more accurate and detailed assessment of economic loss in these animals than has hitherto been possible. So far only preliminary reports are available and these have not calculated disease incidence in economic terms. The Ministry have also been conducting a sample survey of losses in pigs. Such surveys, though very useful in several directions, cannot, of course, be expected to reveal the complete picture. For example, they must inevitably leave out of account most subclinical disease, and probably some clinical illness that is not fatal, especially conditions such as scours in young animals when these are not attributable to known specific disease.

A survey conducted by the Farm Economics Branch of the Cambridge School of Agriculture showed that on different farms the average amount of meal required to produce a bacon pig varied from 5 to 9 cwt., and the average return per pig varied from a profit of £7 to a loss of £3. Food conversion is of course of fundamental importance in economic production. Each 0·1 improvement in conversion rate represents a saving of 4s. 3d. per bacon pig, or £21 per 100 pigs. The wide difference between the best and the worst is due to a number of factors but there is no doubt that disease plays an important part.

Nowadays poultry and pig production is becoming more and more organised on factory lines—terms like "agribusiness," "integration"—vertical and horizontal—indicate the higher degree of organisation being applied. Extreme intensification places a greater emphasis on the importance of health than ever before. Firstly, diseases one is hardly aware of under old-fashioned extensive conditions are able to spread readily, and hence their incidence in a flock becomes higher and often also their effects are more serious. Secondly, the production programme is set on the assumption that the animals grow rapidly and if they fail to do so the planning schedule is disrupted; packing houses may be left idle, distribution centres without stock, etc. Thirdly, mass production goes hand in hand with a small margin of profit per animal and the intervention of disease easily turns a small profit margin into a loss.

The margin of profit on broilers is said to have been about 1s. per bird during the last 18 months and is expected to come down to 6d. in the next year or two. With these margins it is obvious that a high order of reliability and efficiency is absolutely essential. A very small setback from disease can cause a serious loss. Estimates by the British Broiler Growers' Association indicate that death loss of 8 per cent. of birds can reduce the profit to nil, and 12 per cent. would result in actual financial loss. But occult infections, they point out, can be far more serious than the obvious death losses. Not only must mortality be virtually eliminated, and obvious clinical disease, but the health must be of a very high order.

Losses in poultry from disease were discussed at last year's B.V.A. Congress by Dr. Gordon. He estimated that in broilers the average mortality was 4 per cent. He also pointed out that occult disease often caused more serious economic loss than death losses: depressed growth rate, food conversion and reduced value of the carcase can readily turn a profitable enterprise into a losing one.

Losses from Inapparent Disease

In the past we have talked of health in terms of mortality and morbidity, the latter being based on clinical examination. This is no longer sufficient. We have to think of health in relation to production and measure the effects of disease on food conversion and growth rate, milk or egg production, which are much more sensitive indicators than clinical examination, or even laboratory tests.

It is common practice in animal husbandry to measure the effects of management factors, of housing, and of nutritional factors by experiments which measure their effect on growth and food conversion. We veterinarians must apply the same techniques to the study of disease if we are to take part in the advances in modern production. There is no "normal" for growth rate or food conversion. The figures being attained are constantly improving like records in athletics. To-day's outstanding results are the normal of to-morrow.

We realised at Cambridge some years ago that a new outlook was needed in assessing the importance of a disease that did not kill and we measured the effects of virus pneumonia of pigs on growth and food conversion. I think the experiments we carried out then were perhaps something of a pioneering effort in the field of infectious disease, at any rate they stirred up some argument and criticism which is so often the lot of pioneer work! I think the time has come when this type of experiment should be done with all clinically mild diseases. A similar approach

has been used by Dr. Chu working with infectious bronchitis of chickens. This disease is a very mild one but it causes a drop in egg production. Chu tested the efficacy of a vaccine by comparing the drop in egg production in vaccinated birds with controls. His experiments, so far only of a preliminary nature, suggest this is a good way of testing vaccines against the disease.

Theoretically we could get a fairly accurate assessment of the economic significance of subclinical infections by doing trials on completely germ-free stock. However, there is no prospect of germ-free stock being a practicable proposition in the foreseeable future. It is possible, however, on an experimental scale, to rear poultry and pigs that carry virtually no infection from their parents. Experiments with these animals might give us new values for growth rates and food conversion. There is a movement in the United States to establish so-called disease-free herds of pigs on farms starting with stock taken by hysterectomy and reared without contact with their dam or any other pigs. Dr. George Young and his colleagues hail this method of establishing so-called disease-free herds as an important new principle in disease control. This may be a major break-through, because instead of bringing individual infectious diseases under control one at a time as control measures are worked out for each, it aims at controlling at one blow all infectious diseases not transmitted *in utero*. The success of the scheme would seem to depend on very strict, perhaps quite elaborate, precautions to keep infection out of the new herds. How far this is practicable under farm conditions remains to be seen.

Young and his collaborators have published some limited observations in which they found that pigs in "disease-free herds" reached 200 lb. live-weight on an average a month earlier than pigs from ordinary commercial herds in which virus pneumonia and atrophic rhinitis were known to be present. A reduction of one month in the time taken to reach market represents a very considerable increase in the profitability. It is not known how much of this improved performance was due to freedom from pneumonia and rhinitis and how much to other unrecognised infections.

Perhaps experiments with truly disease-free pigs will help throw light on that vague trouble known as "pig sickness." Probably pig sickness is to some extent due to a build-up of known pathogens such as Ascarids, but some people suspect that a hitherto unrecognised factor may be involved. Although we do not know exactly what we are dealing with, most people agree that long-continued occupation of premises by a particular species often leads to a state of affairs where that species fails to thrive, but if the premises are rested, then restocked, the animals will thrive again.

I mention this condition as a rather extreme example of an infection (presumably) which does not cause clinically recognisable disease but nevertheless is capable of affecting efficiency of production considerably and thus requires investigation. Another example, or possibly another manifestation of the same thing, is the improvement in growth rate and food conversion produced by feeding antibiotics. Their mode of action is still not understood but is thought to be through control of some mild infection, since a beneficial effect cannot be demonstrated in germ-free stock.

The 15 per cent. estimate of losses due to disease mentioned earlier is based mainly on clinically recognised diseases. Losses from subclinical disease are very difficult to assess but they are undoubtedly large. Thus the total loss from disease may be well over the £150,000,000 arrived at on the basis of 15 per cent. on an annual production of £1,000,000,000.

Positive Aids to Production

This brings me to positive steps to improve production beyond what has been regarded as the physiological normal of the disease-free animal. In our efforts to improve production we are not restricted to the removal of disease. Already there is a range of products which have been shown capable of artificially stimulating growth and efficiency of food conversion—hormone implants in poultry and cattle, antibiotics in feed, copper in pig food, etc.

The exciting thing about this field is that there is virtually no limit to what may be accomplished. If we succeed in entirely eliminating loss from disease the saving to the nation would be of the order of £150,000,000—probably more, since this figure takes into account only recognised clinical disease—a very great achievement indeed, but nevertheless there is a limit, and in time we must get very close to it. With the positive measures to which I am now turning attention there is theoretically no limit.

We are accustomed to take for granted that each animal has a certain growth potential. To-day we commonly see pigs 3 to 4 lb. at birth reach 60 lb. at 2 months of age. Although this figure is impressive compared with results obtained only a decade or so ago, has the normal physiological limit yet been reached and, if so, what determines the limit ? We know little about the physiology of growth rate and no one could say to-day what prevents a baby pig, fed *ad lib.*, reaching 60 lb. at 1 month of age—or even a week !

Apart from the traditional minerals and vitamins, food additives may be divided into several categories. There are those aimed at controlling specific parasites, for example, the coccidiostats ; those aimed at improved nutrition, such as amino acids and trace elements ; those used for their known physiological or pharmacological action—hormones, antithyroid substances, arsenicals and tranquillisers; and lastly there are those which have a beneficial effect for reasons not yet properly understood, namely antibiotics, and copper for pigs.

Of these 4 categories perhaps the pharmacological group is the one where most advances can be expected. It is no exaggeration to say that developments of recent years in the science of pharmacology generally have been revolutionary. In the veterinary field we have seen that oestrogens implanted in bullocks can lead to as much as 25 per cent. increase in growth rate and an improvement of 15 to 20 per cent. in food

conversion efficiency, and similar results have been obtained in other species.

Admittedly, artificial stimulants to growth may well bring their own disease problems. There are always prophets of gloom whose main pleasure seems to be in pointing to the untoward effects of anything new, but we should not be discouraged by them. It would be naïve to expect anything that profoundly affects the metabolism of the animal to be wholly beneficial in all instances. These issues must be faced and occasional ill effects should not be allowed to discourage use of products if in most instances the effect is beneficial.

The Economics of Research

I think I have said enough to conjure up in your minds a picture of great wastage due to disease. This is something of which members of the profession are, of course, well aware ; but I doubt whether the economic consequences to the nation are generally appreciated.

What has been and what is being done on the national scale to reduce these losses ?

Already in the last century the veterinary services eradicated from the British Isles rinderpest (which killed 500,000 cattle in one period of 18 months), contagious bovine pleuropneumonia and sheep pox. This century rabies, glanders and sheep scab have been added to the list. Other infectious diseases, while not eradicated permanently, have been kept down—foot-and-mouth, swine fever, fowl pest and, of course, bovine tuberculosis. Effective vaccines have been developed and widely applied to many other diseases—brucellosis, clostridial diseases of sheep, for example, and great progress has been made in the prevention and treatment of parasitic diseases and metabolic diseases. There is much to be proud of and I feel that the nation, as well as the profession, should honour that small band of devoted men whose research efforts have brought such benefits to all.

The economic benefits which have already accrued must run into hundreds of millions of pounds, indeed it is no exaggeration to say that the prosperous British livestock industry could not exist but for the application of disease control methods evolved over the last century. There are many examples of a few thousand pounds invested in research bringing rewards worth millions. There must have been millions of cattle saved in Africa and Asia by attenuated rinderpest vaccine discovered by Edwards, and millions of sheep all over the world saved by vaccination against enterotoxaemia following Bennetts's discoveries.

But as we have seen, there is still a very great deal to be done. I think that the main reason for looking at past achievements is that they illustrate what can be done by the application of science to problems of animal health. I would go so far as to say that the history of medical and veterinary science shows that all problems of disease can be solved by research and that nearly all animal disease will prove preventable eventually.

Our whole modern industrialised civilisation is based on the application of science. It is now universally recognised that research is an essential item of expenditure for industry and for governments. Not only is it essential for progress and for keeping up with other countries but it is necessary even to maintain the *status quo*. Like the Red Queen in *Alice in Wonderland*, we have to keep running in order to stay in the same place and to run very fast indeed if we are to make any progress.

In 1955, the latest year for which I have been able to find figures, the manufacturing industries in this country produced goods to the value of £6,500,000,000 and spent £183,000,000 or 2·8 per cent. of the value of gross production on research and development. In the United States of America it is said that a still larger percentage is spent in this way, possibly twice as much.

The expenditure on total agricultural research in the United Kingdom for 1954–5 was about £6,000,000 in an industry with a total production of about £1,500,000,000 or £4,000,000 on animals, which produce £1,000,000,000. This works out at about 0·4 per cent.; contrast this figure with 2·8 per cent. for the manufacturing industries—only one-seventh as much !

Perhaps the chief reason why so much less is spent on research in agriculture than in the manufacturing industries is that agricultural production is nearly all in the hands of individual farmers, whereas in the manufacturing industry production is mostly in the hands of big firms. Consequently, agriculture depends largely on the Government for support of research and I can only conclude that the government authorities have not sufficient appreciation of the need for investing money in research and the rewards it has to offer.

It occurs to me that another reason why there is not more importance attached to veterinary research by the Government is the widespread ignorance as to what veterinary research can do towards the control of animal diseases. Occasionally one gets a shock when one hears even an educated person assume that we are occupied primarily in looking for cures or trying to copy the medical profession, which is mainly concerned with treatment of sick individuals. Perhaps there is insufficient realisation outside veterinary circles that in our work there is more emphasis on prevention of disease and that we can, and do, accomplish much more in this direction than can our medical colleagues, mainly because we have very much more control over our animals than they can exercise over human beings. Also we can employ measures that entail slight risks to the individual, and further, the individual may be sacrificed if it is necessary for the good of the herd.

Last year the Government spent £260,000,000 on farm subsidies, of which £130,000,000 was directly for animal products, but only £3,500,000 on research on animals. Remembering that the losses from animal disease is £150,000,000 or more, surely this is an unenlightened policy. By investing a substantially larger amount on research—say 2 or 3 times as much—the saving on disease losses alone may well cancel out the subsidies within a couple of decades. Money put into research is invested, for the gains are permanent,

but money put into subsidies is spent and yields no dividends in future years.

Last year £3,500,000 was paid out in compensation for fowl pest. How much do you think was spent on research on this disease ? I cannot give you a figure but I would guess not more than a few thousands at most, and perhaps only a few hundreds. Nor is this an isolated example ; there are other diseases which cost the country millions a year but on which the research expenditure is likewise pitiable—pneumonia in pigs, scours in pigs and avian leucosis are examples. Each of these conditions causes losses probably even greater than fowl pest.

The Pig Industry Development Authority was set up by the Government and charged with the duty of promoting the pig industry. This industry has an annual output of the order of £150,000,000 and is directly subsidised by the Government to the tune of about £20,000,000 a year. The losses from disease alone are probably 20 per cent. of the production figure—something like £30,000,000. How much are P.I.D.A. spending on research ?—a mere £20,000—about 1/25th of their budget.

What is the explanation for this state of affairs ? Is it because it is politically expedient to subsidise the farmer—to alleviate his symptoms rather than treat the disease ? Is it because Treasury officials do not fully appreciate the extent to which modern agriculture is dependent on science ?

There is one excuse often made by people who should know better ; namely, that there are not enough young men and women properly trained and willing to go into research. This is a half-truth and, like most half-truths, is dangerously misleading. The whole truth of the matter is that if really adequate funds were made available to offer good facilities, good pay and good prospects, the research workers would soon be found. There are always bright young people coming on and they are attracted into those careers that offer the best prospects for their talents. I have sat on committees where it was agreed more research was badly needed in a certain direction but at the same time it was agreed there was little chance of getting it done because no research workers would be found for the salaries the Treasury would allow.

When the control of foot-and-mouth disease cost the country £2,500,000 in compensation in 1952, and when the compensation for fowl pest rose to £3,500,000 in 1959, the Government set up special committees to enquire into these diseases. But we are losing something like £150,000,000 every year from diseases in general and there seems little concern about it. I should like to see a committee to enquire fully into the economics of animal health in general and to recommend ways of expanding veterinary research and removing the obstacles by which it is at present limited.

It is fashionable to-day to talk of young people who are dissatisfied with the world as they find it as " angry young men." I am no longer young but I get angry when I see research treated as a Cinderella and insufficient research done to check the enormous waste—and suffering—that goes on due to disease,

(*Concluded at foot of adjoining column*)

most of which could be prevented by investing more realistic sums of money in research. I hope my remarks may have stirred a similar feeling in some of you, for until people get angry about the present state of affairs, there is not likely to be much done to change it.

C

A HISTORIC ANNOUNCEMENT

Under this heading last week we quoted from the circular sent by the Ministry of Agriculture announcing the attestation of the whole country as from to-day, October 1st. The Minister decided to mark this great event and pay tribute to those who had made it possible by holding an informal meeting at the Ministry in Whitehall Place on September 26th. The Minister's guests included Mr. Sydney Jennings, President of the B.V.A., Mr. G. N. Gould (Senior Vice-President of the R.C.V.S.), Mr. Harold Wooley, President of the National Farmers' Union, Mr. J. W. Salter Chalker, Chairman of the Animal Health Committee of the N.F.U., Mr. C. P. Quick and other senior officials of the Ministry, together with representatives of the national and veterinary press, broadcasting and television.

In addressing the company, and toasting them, the Minister described the eradication of bovine tuberculosis as a great agricultural achievement, brought about by the co-operation of veterinary surgeons in the Government service and in private practice, farmers and the Ministry. It had been an honour for him to sign the Order which declared Britain free of tuberculosis. He regretted the absence of the Chief Veterinary Officer, Mr. J. N. Ritchie, but was able to announce that Mr. Ritchie's health was steadily improving. He proposed to send a message saying how much the C.V.O. was missed on this occasion (applause.)

The success they were celebrating that day had come at the end of a long and arduous road. It could not have been traversed successfully without the willing co-operation of the National Farmers' Unions, the agricultural industry and the profession. The whole country was in their debt and their efforts had been most helpfully supported by the press and by the wireless and television authorities.

In replying, Mr. Salter Chalker said that this campaign had been an example of what co-operation could achieve. A big field remained for the eradication of other diseases, and if similar co-operation were forthcoming success would again be assured.

Mr. G. N. Gould said how much Mr. Ritchie's absence was regretted both as Chief Veterinary Officer and as President of the Royal College. Mr. Ritchie might justly be described as the chief architect of the eradication scheme (applause).

Mr. Gould wished to remind his audience that the preliminary steps in TB eradication had been taken by veterinary surgeons in private practice and their work had made the official scheme possible. He wished to comment upon the harmony and unity which existed between private practitioners and veterinary surgeons in the Ministry's service.

Tumours of Farm Animals:

A Survey of Tumours Examined at the Royal Veterinary College, London, during 1950-60*

BY

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SUMMARY.—To serve as a basis for discussion, a survey has been made of the tumours from farm animals examined in the Department of Pathology of the Royal Veterinary College, London, in the past 10 years. The 452 tumours included 90 from horses, 293 from cattle, 38 from sheep, 27 from pigs, and 4 from goats. A comparative account is given of the tumours in the various body systems of the species concerned. The important tumours were: in the horse—melanomas and fibromas of the skin, and carcinoma of the penis; in the ox—melanomas, fibromas and warts of the skin, "eye cancers," lymphosarcomas, fibropapillomas of the penis, and vaginal tumours; in the sheep—lymphosarcomas and liver tumours; in the pig—lymphosarcomas and embryonal nephromas. Three of the 4 tumours from goats were lymphosarcomas. The importance of lymphosarcoma as a "wide-range" tumour is again illustrated.

Introduction

WHILE there are a few kinds of tumour which do not seem to be particularly rare in farm animals, the average practice may not yield many examples, even of the more common types, so that it is not surprising that no practising veterinary surgeon in this country has yet published any extensive survey of such tumours. Most of the information that is available naturally comes from a study of material passing through abattoirs and pathological laboratories. Material of this kind is often rather inadequately documented from the clinical aspect (see Cotchin, 1958, for an indication of what information should be provided when submitting specimens for examination, and why). It is desirable that practitioners who have experience, for example, of the results of operative removal of certain kinds of tumour, should publish their findings for the benefit of their colleagues.

Still, it is possible, from a survey of our rather limited material in the London college, and from a survey of the literature, to pick out points which may be of interest in practice and, from the clinical histories sometimes provided, a certain amount of information can be given of the clinical signs that may be associated with some forms of tumour. To serve as a basis for discussion, a survey has been made of the specimens examined in our Department in the 10-year period ending March, 1960. During this time, no special attempt has been made to make any comprehensive or particular studies of farm animal tumours, the specimens being largely ones that have been submitted as a matter of interest by colleagues in practice or at abattoirs. With a few exceptions (cases in which histological sections only have been submitted), the specimens have been examined macroscopically and histologically.

In the period, 452 tumours of various kinds were examined from farm animals, being distributed amongst the various species as shown in Table I. (It should be noted at the outset that the word "tumours" is used in preference to "neoplasms," as some of the lesions, it will be seen, are probably not truly neoplastic.)

TABLE I
SHOWING SPECIES OF ORIGIN OF 452 TUMOURS OF FARM ANIMALS EXAMINED AT R.V.C. LONDON, 1950–60

Species	Number of tumours
Horse	90
Ox	293
Sheep	38
Pig	27
Goat	4
	452

The number of tumours examined for some of the species is rather low, as compared with some other surveys, such as those of Nair and Sastry (1953-4), who surveyed 1,943 tumours from cattle examined in the Pathology Department of the Madras Veterinary College from 1940 to 1951; of Monlux, Anderson and Davis (1956), who, in a 2-year survey of tumours in animals slaughtered at Denver's federally-inspected abattoirs, described 908 bovine, 66 ovine, and 28 porcine tumours; or of Plummer (1956), whose report included 14 equine, 447 bovine, 28 porcine and 6 ovine tumours, chiefly (apart from the equine tumours) from abattoirs in various parts of Canada in the period 1951-1955.

It should always be remembered that, while it is theoretically possible for neoplasms to develop in any tissue of the body (the lens of the eye seems to be about the only structure not recorded as giving rise to tumours), experience shows that, in each species of animal, certain kinds of tumour are much more likely to occur than others. The "spectrum" of tumours differs from species to species, even allowing for the effect of factors such as age at slaughter, and information about tumours in man, say, cannot be transferred wholesale to other species. Important cancers of man, such as those of the lungs,

* Substance of an address delivered at a meeting of the Royal Counties Division at Reading, May 27th, 1960.

the mammary gland, the glandular stomach and the prostate gland, are rare or practically unknown in farm animals, while in these animals tumours which are of little importance in man, such as conjunctival carcinoma, may occupy an unusually important position.

Systematic Classification of Tumours

In this present survey, while the tumours could be classified and dealt with from two aspects—either according to the species affected, or according to the organ involved—it will help to bring out this "spectrum" aspect to deal with the tumours system by system, as in Table II.

TABLE II
SYSTEMATIC CLASSIFICATION OF 452 TUMOURS FROM FARM ANIMALS

System of origin	Horse	Ox	Sheep	Pig	Goat	Total
Cutaneous ...	54 (3+)	98(38+)	4	3	—	159
Lymphatic ...	—	63	10	15	3	91
Alimentary ...	13	23	14	—	—	50
Male genital ...	10	14	—	—	—	24
Female genital	—	23	—	—	—	23
Skeletal ...	3	2	3	1	1	10
Endocrine ...	1	8	1	—	—	10
Urinary ...	—	—	—	6	—	6
Others ...	1	2	2	2	—	7
Miscellaneous and unknown	8	60	4	—	—	72
	90	293	38	27	4	452

+ = "Eye cancer."

A. "Other Systems"

The tumours in the "other systems" shown in Table II can be briefly mentioned before turning to the other named systems: In the *horse*, there was only one primary tumour of the respiratory system—an adenocarcinoma of the frontal sinus. In the *ox*, there were 2 nervous system tumours—a cerebral glioma, which has been reported by my colleague, Dr. Luginbühl (1956), and a tumour, apparently a Schwannoma, of the pericardium of an aged Hereford cow (see Monlux & Davis, 1953). The 2 tumours from *sheep* included a sarcoma of the heart of a ewe, and a malignant melanoma affecting the left eye of a ewe, with regional nodal metastasis. (One possible lesion of jaagziekte was seen, but as there is some doubt as to the diagnosis, it is not included in this present series. It would be interesting to know if this condition has died out in England, as it did in Iceland in 1952 [Sigurdsson, 1958]). Two *pigs* showed lesions of chloroma as described by Claussen (1928). In one pig, there were widespread multiple lesions of the skin; in the other (sections only seen), there were lesions in the spleen, lymph nodes and kidneys, and the periosteum of some bones was green in colour.

B. Cutaneous System, Including Integument of the Eye

Just over 35 per cent. of the total number of tumours fell into this system. While the horse and ox provided most of the skin tumours, mention can be made of the tumours from the other species. The *pig* provided 3 tumours—a melanoma in a 5-month-old porker, a spindle-cell sarcoma, removed, apparently with success, from the face of a new-born piglet, and a fibroma of the end of the snout of a Large Black sow. The 4 *sheep* tumours comprised a fibroma of the brisket of an 8-year-old Cheviot ram, a pedunculated fibroma of the skin near the eye of an aged sheep, a papilloma, with markedly vascular stroma (one of multiple lesions of the legs) of a 9-month-old Suffolk ram, and an angiomatous tumour (possibly a malformation) of the inner integument of the ear of a new-born Welsh lamb.

In the *horse* and *ox*, the important tumours were fibromas or fibropapillomas, melanomas, and (particularly in the ox) "eye cancer." The numbers seen of the various kinds are shown in Table III.

TABLE III
SHOWING THE IMPORTANT SKIN TUMOURS OF HORSE AND OX SEEN IN THE 10-YEAR SURVEY

	Species	
	Horse	Ox
Fibroma	34	17
Fibropapilloma ...	—	17
Melanoma	8	17
"Eye cancer" ...	3	38
Others	9	9
	54	98

(i) *Fibroma of the Skin of the Horse*

This is the commonest type of skin growth of the horse (Head, 1953). It is sometimes difficult (as in 3 of our cases) to be certain whether the lesion is merely one of exuberant granulations—these latter seem rather prone to form in the skin and subcutis of horses after wounding, either surgical or accidental. The lesions take the form either of bulging, and sometimes ulcerated, masses of fibrous tissue, or of more deeply-seated masses of very well-defined contour. The lesions are often single, but may be multiple (as in 7 of our cases). Successive crops of such lesions may develop. Both the ulcerated and the deep-seated forms may occur on the same animal. Any part of the body may be affected, but particularly the limbs and underparts. The well-defined fibrous forms may be particularly seen on the prepuce (6 cases) or the eyelids (5 cases). There is some indication that the ulcerated type may sometimes start off as a deeper growth, which becomes progressively more superficial.

These 34 fibrous tumours of the horse's skin included at least 10 examples of what seem to be lesions of the kind which Jackson (1936) called "equine sarcoids." Those are of importance because of their tendency to recur after removal, and because they are often multiple. There is some indication that "equine sarcoids" can be transferred spontaneously from one part of the body to another, as by biting or scratching, or possibly by the harness or by attendants' hands.

Olson and Cook (1951) in America have made the

very interesting observation that lesions of the histological appearance of "equine sarcoids" can be produced experimentally in horses by injecting bovine skin wart material into the skin. While the converse experiment, of injecting spontaneous "equine sarcoid" material into cattle skin has not apparently been reported, this observation raises important possibilities from the point of view of aetiology, prevention, and vaccine therapy.

(ii) *Fibropapillomas ("Warts") of the Skin of Cattle*

With 2 exceptions (animals 4 and 9 years old), the wart-bearing animals were 1 to 2 years of age, averaging 18 months. These well-known lesions still present certain problems as regards aetiology, epidemiology, prophylaxis and treatment.

One point worth discussing is that of the possibility that a variety of types of "wart" occur on the bovine skin—as shown by differences of morphology. Another point is that of methods of treatment. Pearson, Kerr, McCartney and Steele (1958) and Steele-Bodger and Wright (1959) have reported on the apparently successful use of tissue vaccines in the treatment of bovine papillomas. To overcome the limitations of observations on spontaneous tumours —the disease being self-limiting, with difficulty of predicting the course in any one animal—Olson and Skidmore (1959) studied the therapy of experimentally-produced lesions. I quote their conclusions: "Results from either administration of vaccine or excision of some warts indicate that neither method is particularly effective in treatment of the disease. The results do indicate that excision during the early stages, as well as vaccine therapy, may actually prolong the disease. Warts could be excised from an individual animal, with small likelihood of recurrence, if the warts were present more than three months. If warts were a herd problem, individual animals with warts could be treated by this method and consideration given to a programme of immunisation of the calves with wart-tissue-vaccine for prevention of the disease. A vaccine prepared with warts from animals in the herd is preferable, and the animals should be immunised prior to exposure."

(iii) *Other Fibrous Tumours of the Skin of Cattle*

These were generally subcutaneous tumours, including a few occurring near the base of the teat. It is of course necessary to distinguish fibromas from lesions of actinobacillosis.

(iv) *Melanomas of the Skin*

In view of the fame of equine melanomas, it is perhaps a little surprising that the ox should have provided more than twice as many melanomas as the horse. The equine tumours are very well-known, although even yet not really adequately investigated, while little has been written about the bovine melanomas—perhaps this is why more of the latter were sent in for examination.

Horse. Melanotic tumours occur frequently in grey horses (all 8 of our cases were in greys), but they do occur in other coloured horses too. Apart from melanotic papillomas (which may be congenital—we saw one in a 5-day-old foal), the equine melanoma is a dermal or subcutaneous lesion, over which the skin may remain mobile and non-ulcerated for some time. The common sites are on the underside of the tail near its root, and the peri-anal, perineal, para-vulval and preputial regions.

The tumours are mostly seen in aged horses, and the condition tends to run a clinically benign course over a long period. There may be extensive internal deposits of melanin without really definite tumour formation, but true metastasis does occasionally occur, with lesions in the pelvic and iliac nodes, the spleen (which may be enormously enlarged) and other parts of the body. A test for the presence of melanomas of the internal organs has been suggested by Taranov (1956), based on the assumption that the serum of an affected horse has a greater tyrosinase activity than the serum of a healthy horse.

Cattle. As compared with horses, melanomas occur in quite different circumstances in cattle. They tend to develop in young animals, often even in calfhood—9 of our 17 cases were 18 months of age or under. They tend to bulge up from the skin surface as large (up to $20 \times 20 \times 14\frac{1}{2}$ cm.) dome-shaped masses, with jet-black cut surfaces. They are practically always benign. They have been particularly reported in the Aberdeen Angus (Head, 1953), but in our series, there was a wide range of breeds affected: Aberdeen Angus (3 cases), Shorthorn (2), Jersey (2), Ayrshire (3), Red Poll, Guernsey, Guernsey-cross-Friesian (each one). It may or may not be significant that we have no example from a pure-bred Friesian.

(v) *"Eye Cancer"*

This tumour, while of some significance in horses (Runnells & Benbrook, 1942), and also occurring in sheep (Davis & Shorten, 1952), is of very great importance in cattle in some parts of the world. In Monlux *et al.'s* (1956) series of 908 bovine tumours, there were 722 squamous-cell ocular neoplasms; in Nair and Sastry's series of 1,943 bovine tumours, there were 836 "eye cancers," and in Plummer's series of 447 bovine tumours, there were 96 squamous-cell carcinomas involving the orbit. This present series includes 6 such tumours from cattle in Kenya, and 32 from this country. All but one of the affected animals were female. The tumours occurred in Hereford and Hereford-crosses (5 cases), Shorthorn (7), Friesian and Friesian-crosses (8) and Ayrshire and Ayrshire-crosses (11 times). In America, the disease is of course predominantly reported in Herefords. Nair and Sastry do not mention the breeds affected in their series.

The tumour is one of older animals—the youngest affected in our series was 2 years old, others being aged 5 years (5 animals), 6 (7), 7 (2), 8 (5), 9 (1), 11 (1) and 12 (1) years respectively. Three others were reported to be "aged."

In 18 of the 38 animals, the lesion developed on the third eyelid (both membranes being affected in 2 animals), on the eyelids in 12, the cornea in 4, and in the orbital sac in the other 4. Monlux, Anderson and Davis (1957) found squamous-cell carcinomas of bulbar conjunctiva and cornea in over 50 per cent. of their cases.

While all our cases were squamous-cell carcinomas histologically, only one is known to have metastasised (to the parotid lymph node). Monlux *et al.* (1957) agreed with previous reports that carcinoma of the bovine eye is a tumour which usually metastasises only after a long period of progressive growth; those originating on the eyeball metastasise only in the most advanced stages.

A considerable amount of work is being done on this very important tumour in America, with particular reference to aetiology, heredity, and relationship to eyelid pigmentation in Herefords. It would be of interest to study the condition intensively in Herefords in their native county. We have 3 examples of squamous-cell carcinoma of the conjunctiva in horses (12-year-old carthorse mare, 12-year-old gelding, and 9-year-old cob gelding, respectively), but none in the sheep.

(vi) *Miscellaneous Skin Tumours*

Apart from these important forms of skin tumour in horses and cattle, there were some other miscellaneous forms:—

Horse. Papilloma: Eyelid of 15-year-old Thoroughbred; vulva of 10-year-old grey pony mare; vulva of 25-year-old pony mare; skin, over firing scars, of 6-year-old Thoroughbred mare; pigmented papilloma of skin of 5-day-old foal (already mentioned).

Fibrosarcoma: of coronet.

Sweat-gland adenocarcinoma: by vulva of aged pony mare.

Sarcoma: Multiple "round-cell" sarcoma (? lymphosarcoma) of 21-year-old cart-horse mare; similar lesions of skin of chest of a mare.

Ox. Three vascular proliferative lesions—skin of thorax of 5-year-old crossbred cow; of side of neck of 3-year-old Friesian cow; of posterior thoracic region of 6-year-old Ayrshire cow.

A larger, angiosarcoma-like lesion, towards the tip of the tail of a 2-year-old Hereford heifer.

Lipoma: of back of cow.

Neurofibroma (? of fifth nerve termination): of muzzle of cow.

Spindle-cell sarcoma: of tail of 7-year-old Ayrshire cow.

Sarcoma: of skin above eye of cow.

Baso-squamous tumour: of tail of middle-aged Ayrshire cow.

C. Lymphosarcoma

This is the "wide-range tumour" (Cotchin, 1956) of most importance in domesticated animals, and in our survey it was found in all the species concerned (2 examples in the horse, affecting the intestine, are classified with the tumours of the alimentary system).

The condition is of most importance in cattle and pigs, but the other 2 species provided some interesting examples.

Goat. Three of the 4 caprine tumours seen were lymphosarcomas. Two of the affected animals showed lesions in the anterior mediastinum (these may have arisen from the thymus). One of these goats, a 2-year-old female, had never "done well." It was a poor milker, and had given 2 stillborn kids. For a period of 6 months it had lost weight although its appetite remained good, and there was persistent slight bloat. At autopsy, a lymphosarcoma was found in the mediastinum, weighing 2.5 kg.

Sheep. Lymphosarcoma was second only to liver tumours in occurrence in this survey. In 5 of the 10 cases, there was a more or less generalised lymph node enlargement; in 3 animals (one of which was jaundiced), the liver and related nodes and the posterior mediastinal nodes were affected; 1 sheep showed a lesion in the anterior mediastinum, and the tenth showed a lesion in the sublumbar lymph nodes.

Pig. In this survey, lymphosarcoma (see Englert, 1955) was the commonest tumour of pigs (15 cases). Information was incomplete about some of the lesions, but in 4 pigs the tumour affected most of the lymph nodes, while in the other 11 pigs the lesions occurred in more restricted areas, involving the anterior mediastinum (? thymus) particularly in 3 pigs, and the liver, kidneys and spleen in 7 others. All but 3 of the pigs were females. Their ages ranged from new-born to 16 months. (Through the courtesy of Mr. K. G. Towers, sections were examined of lesions of lymphosarcoma of the skin (noted at birth), pancreas, tunica vaginalis of testis, liver, diaphragm and stomach, in a male piglet, destroyed at about a fortnight of age.)

Symptoms attributable to an enlarged node in the anterior mediastinum or the throat were sometimes observed. One pig with a lesion in the anterior mediastinum dropped dead, presumably from circulatory embarrassment.

The lesions had a typical lymphosarcoma appearance. The affected nodes ranged up to 10 cm. in length. The infiltrations in the kidneys and liver were sometimes diffuse, sometimes focal.

Ox. Lymphosarcoma in our experience is the most important malignant tumour of cattle, and it is rather surprising that Nair and Sastry only reported 4 cases of "lymphocytoma" in their extensive material. We saw 63 cases, of which 33 showed a more or less generalised enlargement of lymph nodes of "lymphadenosis" type, along with variable involvement of liver, kidneys and spleen. In 17 animals, the main lesions were in the anterior mediastinum and lower neck, appearing to be of thymic origin. The remaining 13 showed more localised lesions, without definite evidence of generalisation.

The cases occurred in young animals particularly, as shown in Table IV.

TABLE IV
SHOWING AGE DISTRIBUTION OF FORMS OF LYMPHOSARCOMA OF CATTLE

Age	Number of animals in age-group		
	Lymphatic leukosis ("Lymphadenosis")	"Thymus"	Other localisations
New-born	2	0	0
0—6 months	7	2	0
7—12 mon hs	4	5	0
1—1½ years	4	2	2
2—3 years	5	4	4
Over 4 years	0	1	3
	22	14	9

It will be seen from the Table (although the figures are incomplete for the 3 groups) that there does seem a tendency for the lymphatic leukosis cases in our series to occur in rather young animals, as compared with those with more localised lymphosarcomas.

Symptoms. The symptoms reported for the lymphatic leukosis cases (lymphadenosis) were most often of the more or less sudden appearance of enlargement of superficial lymph nodes. The temperature was raised in 5 animals, reaching 106° F. in one case. General signs, such as loss of appetite, dullness or depression, and loss of condition, were seen. Enlarged nodes in the thorax sometimes led to a suspicion of pneumonia. Two animals in this series died, the rest were slaughtered.

The animals with the lesions more or less confined to the thymus region, and regional nodes, might show a swelling due to tumour tissue in the central part of the neck, and even more commonly there was oedema here. There was often also slight tympany. Loss of condition and loss of appetite were noted. Three animals showed a raised temperature. The symptoms recorded for animals with lesions with other localisations varied according to the site of the lesions. One animal, with heart muscle involvement, died suddenly at parturition. Another, with a growth in the sublumbar region infiltrating the spinal canal, showed posterior paralysis (as did one of the leukosis cases). One animal showed widespread nodular lesions in the skin.

While these cases of lymphosarcoma seem generally to have been quite sporadic in occurrence, there was a history in the case of 2 "lymphadenosis" animals of 2 (one farm) or "several" (another farm) similar cases having been seen previously on the same farm.

It is important that a careful study be made of lymphosarcoma in cattle in this country. So far, the predominance of cases in sporadic form, often affecting young animals, suggests that we may not be dealing with the endemic form, as described for example by Bendixen (1957, 1958, 1959a, b, 1960). Blood examinations might be worth attempting on farms where cases occur to see whether other animals show the haematological pre-tumorous form that has been reported in these endemic cases.

The possibility seems strong that some forms of bovine lymphosarcoma are transmissible, as indicated by the work of Götze, Rosenberger and Ziegenhagen (1956), of Montemagno, Papparella and Catellani (1957), of Montemagno (1958, 1959) and of Papparella (1959).

D. Alimentary System

The striking tumours of this system in this series were these of the liver of sheep (12 cases). These were all abattoir specimens, and none of them were associated with liver-fluke infestation. The majority of them were liver-cell tumours, although in 3 and perhaps 4 the diagnosis of bile-duct carcinoma was possible. The lesions occurred as solitary growths, often large (up to 14 cm. across), in various parts of the liver. They were of a pale grey or whiter colour, with crenated edges. No metastases were seen.

(The other 2 cases of tumour of the alimentary system of sheep were: a carcinoma of the intestine of a 3-year-old Merino ewe in Kenya, and a squamous-cell carcinoma of the gum of a sheep, of which sections were examined by courtesy of Mr. A. R. Jennings.)

Horse. The alimentary tract tumours of horses comprised 3 tumours which are thought to be adamantinomas (see Gorlin, Barron, Chaudhry and Clark (1959) for discussion, in an extensive survey of oral lesions of domesticated animals, of cysts and tumours of odontogenic origin), one carcinoma of the gum (? malignant epulis), 3 sarcomas of the gum (one invading a head sinus), a leiomyoma of the stomach, a squamous-cell carcinoma of the cardia of the stomach (see Krahnert, 1952), 3 sarcomas of the intestine (2 lymphosarcomas of the large intestine), and a lipoma of the rectum.

Ox. There were 6 tumours of the mouth: squamous-cell carcinoma of gum and palate of an 8-year-old Shorthorn-cross cow; a sarcoma of the lower jaw; an angiomatous lesion (? angiosarcoma) of the lower jaw of a calf; a similar lesion of the horizontal ramus of a 1½-year-old Ayrshire cow; a fibroma inside the lower jaw of a 2-year-old Friesian cow; a squamous-cell carcinoma of the base of the tongue, and the regional node, of a 3-year-old Shorthorn-cross-Friesian cow.

The rumen showed, in 5 instances, fibrous oedematous polyps, often near the cardiac orifice (occlusion of which led to tympany in one cow), and 2 squamous-cell carcinomas of the rumen were also seen.

In the intestine, there were cases of papilloma of the ileocolic valve region and the rectum, in a 6- to 7-year-old Jersey cow; leiomyoma of the rectum of a 3-year-old Guernsey cow; leiomyosarcoma of the rectum of an Ayrshire cow; carcinoma of the large intestine of a 14-year-old Hereford cow.

The liver showed 5 tumours: in 4 cases, these were liver-cell tumours, and in 1 case there were multiple sarcomas, giving the impression of being secondary to fluke infestation. It is curious to note the sparsity of liver tumours in cattle in this series, in view of the large number reported by Trotter (1904) and by Kenny (1944) in Irish cattle—admittedly, most of their cases were in older animals, but the apparently high incidence of liver tumours in cattle in parts of Ireland needs close investigation.

The remaining tumour of the bovine alimentary system was a polypoid adenoma of the gall-bladder of a 2-year-old bullock. Anderson, Monlux and Davis (1958) have reported 18 gall-bladder tumours in cattle—17 being adenocarcinomas. They point out that such tumours might be missed at autopsy unless the gall-bladder was carefully palpated and incised.

E. Male Genital System

Horse. The 10 tumours comprised 8 squamous-cell carcinomas of the penis (and in 2 cases also of the prepuce), and 2 teratomas ("dermoid cysts") of the testis (found incidentally at castration).

The carcinomas affected old animals (10, 18 and 30 years of age being recorded). The affected horse was stated to be entire in 2 instances. Five of the animals were ponies. Two of the lesions metastasised,

in one case after attempted extirpation of the tumour by amputation of the penis. The surgical aspects of this important equine tumour have been referred to by Pires (1950).

Kast (1957) points out the possible importance of an accumulation of smegma in the regions where the tumours are particularly seen to develop—the end of the penis, and the outer preputial fold—which is in accord with the reported carcinogenic action of horse smegma (Plaut & Kohn-Speyer, 1947).

Ox. The 14 bovine tumours included 10 cases of penile fibropapilloma, and 4 examples of tubular adenoma of the testis. Penile fibropapillomas have been well described by Formston (1953). The affected animals were all between 1½ and 3 years of age in this present series, and the tumours affected the glans penis in all but one animal.

The testis tumours all caused great enlargement of the testis. The 3 tumours examined macroscopically were all in new-born calves, measuring 14 × 8½, 7 × 5, and 16 × 7½ cm. respectively. One of the affected calves was said to be twin to a normal heifer calf. A section from a testis tumour of an aged Ayrshire bull was also examined (Mr. Scarnell's case).

F. Female Genital System

In this series, all the tumours of the female genital system affected cattle, and all but 3 were tumours of the vagina. (These 3 exceptions were granulosa-cell tumours of the ovary, affecting a 2½-year-old beef Shorthorn, a 2½-year-old Devon, and a 5-year-old Shorthorn, respectively.) The 20 vaginal tumours included 7 fibromas, 7 lipomas, 3 fibromyomas, 2 leiomyomas, and 1 fibropapilloma.

Two of the fibromas had been responsible for dystocia—one fibroma, 12.5 cm. across, was a pedunculated mass, the removal of which allowed the delivery of a live calf; the other weighed 5 kg.

The lipomas in 2 instances appeared within 2 weeks after calving—in one cow, apparently protruding through a slight tear of the vagina caused at calving.

The fibromyomas and leiomyomas were pedunculated tumours. The fibropapilloma affected the clitoris of a Hereford heifer.

No examples of uterine cancer, as described by Monlux, Anderson, Davis and Monlux (1956), and no mammary tumours, were encountered.

G. Skeletal System

Horse. There were 2 examples of tumorous lesions of the jaw-bones, which have been classified as sarcoma and osteoma respectively. One horse showed a possible osteosarcoma of the frontal sinus region.

Confusion of bone sarcomas with osteodystrophic lesions is possible in horses. It is perhaps surprising that very few limb bone tumours seem to have been reported in horses.

Ox. In the ox, too, limb bone tumours must be rare. The 2 tumours in our series were sarcomas affecting the base of the horn of one animal, and the frontal bone of another.

Sheep. Three tumours have been provisionally included as tumours of the skeletal system: a cartilaginous tumour of the root of the tail; a cartilaginous tumour appearing to be derived from a cervical vertebra; widespread peritoneal deposits of an osteosarcoma, possibly secondaries from a rib tumour.

Pig. The one tumour was a sarcoma arising from (or perhaps merely invading) the right mandible of a Wessex sow.

Goat. Lesions of osteochondrosarcoma affected the rib and sternal region.

H. Endocrine System

Horse. Thyroid tumours are said to occur frequently in horses (Smith & Jones, 1957), but none were seen in this series. There was a lesion, thought to be an adrenal adenoma, in a 15-year-old bay mare, but this was reported to lie behind the left kidney.

Ox. The 8 tumours included in this system comprised a possible pituitary tumour of a calf, and 7 tumours of adrenal glands (4 of cortical type, 3 of medullary).

Sheep. The one tumour was an adenoma of the adrenal cortex.

I. Urinary System

The 6 tumours in this system were all examples of embryonal nephroma in pigs. The tumours tended to be large (up to 13 cm. across). Two of the affected animals were sows. The others were 6 or 7 months of age or "young." In one pig, both kidneys were affected. An excellent description of this kind of tumour is given by Sullivan and Anderson (1959), who found (as in this very much smaller survey) that the embryonal nephroma of swine is less often seen than is lymphosarcoma. They found that 77 per cent. of the tumours in their series occurred in the first year of life, and they comment on the absence of reports of the tumour in very young pigs. The lesions are often single, but not rarely multiple. Very occasionally, metastasis occurs.

It should be noted that no proven cases of urinary bladder carcinoma in cattle were included in this series. This tumour has been particularly studied recently by Pamukçu (1957), and has been observed to develop in conjunction with angiomatous lesions of the urinary bladder such as we see in cases of haematuria vesicalis. Perhaps the occurrence of cancer and of angiomatous lesions is merely coincidental, or, alternatively, perhaps urinary carcinoma is a further phase of development of haematuria vesicalis which does not seem to occur in this country, because the presumed causal agent in Pamukçu's cases was acting either in greater concentration or over a longer period than obtains in such cases here.

J. Miscellaneous Tumours

In this group there may be singled out for special mention 15 cases of diffuse lipomatosis in cattle. Four of the affected animals were male. Their age was not often recorded, but was generally over 6

XUM

years where known. There were various breeds affected—Guernsey (3 animals), Shorthorn (1), Ayrshire (2), Red Poll (2), Dexter (1), Aberdeen Angus (1). The symptoms noted were generally those of an increasingly severe obstruction of the large intestine. One affected bull, an 8-year-old Red Poll, had shown loss of weight, and slow diminution of ability to serve, over a period of 2 years.

Mention might also be made of 7 cases of multiple tumours, possibly primary in origin, affecting the serous membranes of cattle. Such tumours are of importance because of the possible confusion with tuberculous lesions. The peritoneum was usually affected, although one animal (a 9-year-old Guernsey cow) showed pleural lesions as well. In one animal (a month-old calf), the tumour appeared to have extended to the scrotal sac by way of the inguinal canal, and in another (a 5-month-old Shorthorn), the lesion in the scrotal sac only was examined (although the abdomen was reported to be "full of muck" at the knackers'). Grant (1958) has drawn attention to the importance of the occurrence of what appear to be primary serous membrane tumours in new-born or very young calves.

Discussion

It would be wrong to try to draw firm conclusions from the limited survey reported here, but the findings do broadly agree with those reported by others. Generally speaking, each species of farm animal seems to have its own characteristic tumours, with the one important exception of lymphosarcoma, which is of some importance in cattle and pigs, and also occurs in sheep and goats. Lymphosarcoma is of course also a well-known and common tumour in dogs and cats. In this survey, the important tumours have been those summarised in Table V.

TABLE V
SUMMARISING THE TUMOURS OF IMPORTANCE IN THE VARIOUS SPECIES OF FARM ANIMALS IN THE 10-YEAR SURVEY

Tumour	Species				
	Horse	Ox	Sheep	Pig	Goat
Skin: Melanoma	+	+			
Fibroma	+	+			
Fibropapilloma		+			
"Eye cancer"		+			
Lymphosarcoma		+	+	+	+
Liver tumours			+		
Penis: Carcinoma	+				
Fibroma		+			
Vaginal tumours		+			
Embryonal nephroma				+	

Those tumours marked with a cross have provided an important number of cases in the total from the species concerned. The Table thus includes those tumours about which more information should be obtained in this country. The practitioner could help by submitting any tumour he sees in a farm animal to a laboratory for pathological examination. Any tumours encountered in abattoirs or in the veterinary investigation service should similarly be submitted for examination. If full details of age, breed and sex, and clinical and pathological findings, and so on, are provided, we should soon be able to form a more useful as well as a more accurate picture of these interesting tumours. From the pathological aspect, the tumours that would seem to warrant particular study are: melanomas in horse and ox; "warts" of the skin of cattle; "eye cancer" in the ox; lymphosarcomas in all species (this tumour might be given first priority, in view of its "wide range" nature, and of the importance of leukosis studies in cancer research in general); carcinomas of the glans penis of horses (the carcinogenic agent in smegma should be identified); embryonal nephromas of the pig. Although cases of carcinoma of the urinary bladder or of the "horn-core" of cattle were not included in the tumours of English origin in this series (two specimens of the latter tumour were received, one each from India and Pakistan), these tumours too are of considerable importance in some parts of the world, and the study of them should be intensified.

From the practising veterinary surgeon, we would ask co-operation in providing properly documented material for examination, and any clinical or surgical experiences that might be of general value should be published. In this way, the store of veterinary information will be increased, and important contributions to the general problem of cancer and its causes might well be made.

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The Value of Photography to the Veterinary Profession

BY

P. R. GREENOUGH

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SUMMARY.—In this paper the availability of photographic material is discussed, and the uses of the visual medium for purposes of teaching and public relations are considered. Observations on technique are made, together with suggestions regarding the possibility of stimulating interest in photographic productions within the profession.

Material Available

A "LIST of Films of Veterinary Interest" prepared by the Secretariat of the Permanent Committee for the International Congress was prepared in 1959. This list contains titles and details of 735 films, but only about 400 of this number could be considered of practical interest. The list is by no means complete, but will be amended from time to time.

The U.S.A. is easily the biggest producer of veterinary films on a wide variety of subjects, but Great Britain, France, and Australia have a substantial number.

Over 50 per cent. of British films have been sponsored by commercial organisations and many of these, understandably, have commercial rather than purely animal health motives. The Ministry of Agriculture have produced surprisingly few films, but like the commercial productions these have a commentary in sound. The only *sound* film produced at a University veterinary school is that by R. G. Walker of Cambridge; the Royal Veterinary College has films officially acknowledged in the "list," and the 10 films produced by Gordon Knight make him the most prolific producer of veterinary films in this country. The remaining British films recorded are by J. McLintock, a "private sponsor" producer.

There is, undoubtedly, a considerable amount of unrecorded film, but much of this has probably not been titled and edited.

There is no record of the "still" photographic material available either in monochrome or colour, but here again it is certain that there has been a considerable volume of production.

Photography in Education

Both the moving and the still picture are used extensively in education. The value of film was recently considered by Halas and Manvell in their paper "The Animated Film in Science Teaching" of which the opening paragraphs are worthy of inclusion at this point:—

"Let us begin by trying to summarise what those who believe in the right uses of the film in education expect the instructional film to achieve. Training works on 3 levels, usually operating simultaneously or in close association with each other: (1) Imparting comprehension of main principles; (2) Explanation of detail and placing this in the memory; (3) Encouraging familiarity by practical experience.

"Such tests as have been made with people learning have shown that what is seen has a more enduring effect than what is merely heard, and that it pays the serious teacher to use what stimulus he can to rouse our sluggish conscious memories into reasonable activity. The stimulus that is most immediately effective is most often a visual one.

"During the past years, various tests have been conducted in Great Britain, in the U.S.A. and the U.S.S.R. to determine the effectiveness of visual instruction as compared with conventional oral methods. Although these experiments are inconclusive and there is still much room for research, they have shown beyond doubt that visual methods are superior in their capacity to give comprehension, that an audio-visual method is more effective than the spoken word in teaching detail, and that visual methods are definitely superior to others in fixing matters upon the memory.

"The film rightly produced—with a close association between the good film maker (with his knowledge of the technical capacities of his medium) and the good teacher (with his experience in what is needed to clarify and illuminate his subject in the minds of the students)—is by far the most effective way of conveying a wide range of knowledge.

"To repeat the obvious for our present record, the film brings the outside world actively into the confines of the classroom, it can survey a very broad field in a short time, it links the thinking of the student with the practical application and uses of

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Tumours of Farm Animals.—*Concluded.*

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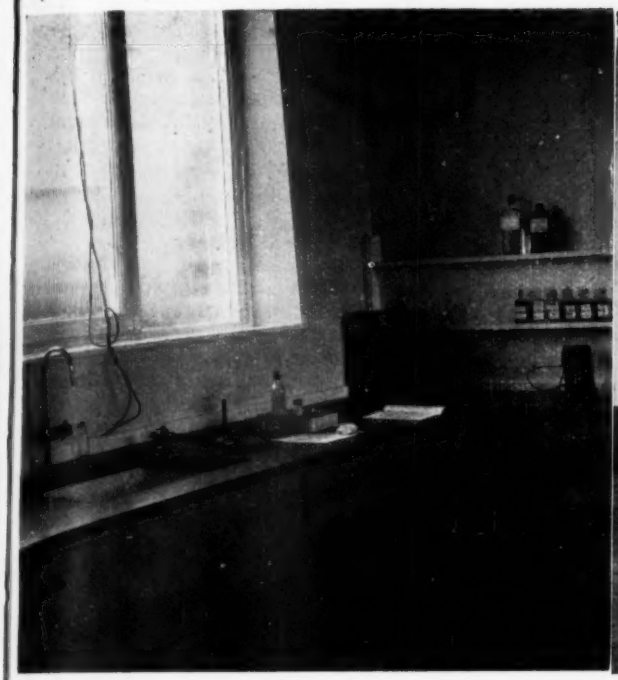

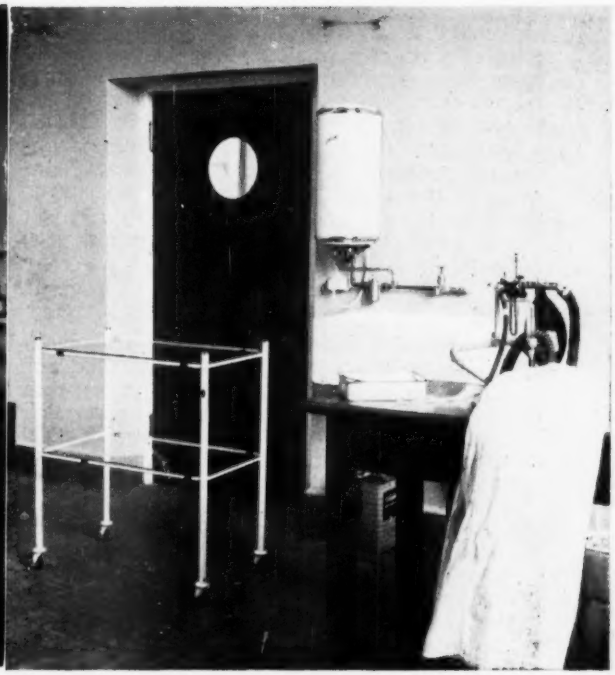

Mr. Greenough practises what he preaches as these photographs of his premises at Castle Cary in Somerset show. The photographs taken by himself show a builder's yard and workshop both before and after conversion into a veterinary surgery.

Top, left—Prior to alterations the premises consisted of a builder's yard and various workshops, all in a poor state of repair.

Bottom, left—View of the main entrance opening into the waiting room. The operating theatre is seen to the left of the door whilst the office section is seen to the right. Note the small doors below the office window; this is the medicine hatch which may also be reached from within. The floor level of the whole of this section is at exactly the same height and gives access on the extreme left to three large animal loose boxes.

The main room of the building is reached from the wash space by a short flight of stairs. In order to conserve movement and economise on heating this room combines several functions. *Above*—The laboratory corner is shown: it is intended that this space will in the future be developed to cope with any increased need for clinical diagnostic facilities.

Right—There are in addition sections of the room devoted to works of reference and writing facilities, a pharmacy, and the secretary's desk (shown here). The radio telephone is to her left hand, the telephone to her right, and the "Enquiries" hatch directly in front.

Top, right — The operating theatre, designed for both large and small animals. It is a well insulated room some 13 feet high with a large north roof light to supplement the very large window in the south wall. The room has fixed wall cupboards for instruments leaving the tiled floor and skirting free for hosing down. The small-animal section shown is reached from the consulting room through the door illustrated. Note the hot air duct in the corner.

his subject, it can with ease and rapidity show the complex parts of a whole in their relation to each other, it can demonstrate the intricate movement of related parts, it can focus attention sharply and emphasise particular points, and it can point parallels with the fluency of its greatest asset, exact timing in the juxtaposing of different moving pictures. Moreover, it has the power to bring the supreme expert into the classroom and place him side by side with the local expert who knows his individual students and their needs."

Public Relations

The profession could do much more with photography in the sphere of public relations. The most effective medium is the documentary film, but there are many instances where the projected slide might be chosen. A slide collection or film strip is much cheaper and easier to prepare and has the advantage of being a more flexible means of visual presentation than the film; the slide series can also be very effectively used in connexion with a recorded lecture delivered from a tape. Many a practitioner would be very grateful for material of this type to take to lay meetings at which he had been asked to speak.

The present-day need for photographic public relations material is due to the advent and increase of television. This medium has awakened a visual receptiveness in the layman that makes the written word or unillustrated lecture much less attractive. The television authorities are continually on the look out for visual material, but in general they accept what is available and tend to be less interested in ideas which leave them to carry out all the work involved. Consequently, within the sphere of our interest, it is other organisations too often, which represent their point of view: it is a matter of initiative and we must be up and doing. If not, we should not be surprised, if, in future, our opinion is sought less and less in matters of animal nutrition, husbandry, and public health. We may remain the experts on animal disease, but are we not capable of moving beyond this very restricted field? At all events, let us not underestimate the power of television which perhaps because of our own inertia or conservatism may, however unintentionally, undermine our position in agriculture and in the eyes of the public.

Public relations is a subject teeming with potential for film presentations that would make it widely known how alive is our profession and how interested in serving the viewer to the utmost of its ability. Does the public appreciate what goes into the training of a veterinary surgeon? Does it realise the extent of the facilities provided by general practice or the protection which a strict code of conduct gives to our clients. Films dealing with preventive medicine, to cite only one example, can be treated in such a way that they are not only entertaining and instructional but leave the impression that the veterinary surgeon is potentially a more important member of the community than the viewer had realised. Another aspect of public relations is to help preserve our good name and reputation. If someone without our qualification claims on TV to succeed in the face of veterinary failure, then the profession should be prepared to answer. If we feel we can provide a more adequate service than can some animal welfare organisations it is our duty to publicise this point of view. One can be modest and self-effacing without carrying it to the point of self destruction.

Photographic Techniques

Moving Pictures

Documentary films prepared for educational purposes usually are of 16-mm. gauge because most teaching establishments have projectors that will accept this type of film. It is not generally realised that a 20-minute film prepared by a professional may cost £1,500 to make whereas the basic cost of material for such a film would be about £40 only and involve a total outlay something of the order of £110. Already certain medical organisations have seen the wisdom of sponsoring the amateur and some cine societies have a waiting list of sponsors. There may be loss of quality in the amateur film, but some such films are actually superior to those made by commercial film units.

The production of good film material is well within the scope of an amateur cinematographer and it is extremely satisfying and enjoyable work; but "lone wolf" productions are fraught with difficulties. Unfortunately many people are too timid to make a start; but most established units are only too glad to have assistance, and if it is possible to perform even the smallest of the responsible tasks confidence and enthusiasm soon mount. If the reader is at all interested in filming it is well worth a try, and there are plenty of cine societies only too willing to help and advise the beginner.

The Future

The medical profession has found many real and important uses for photography both moving and still, whilst overseas some veterinary schools have full-time photographic units. It would seem that the trend towards the increased use of this medium is a progressive one and it would be unfortunate if our profession in this country were to lag behind. In order to promote our interest in this sphere it would seem reasonable to suggest that a "Veterinary Audio-visual Association" be formed. Even if the number of persons interested were found to be small, it nevertheless could perform valuable work. The proposition could be summarised as follows:—

Object. To promote collaboration and to assist members of the veterinary profession who are interested in photography and associated techniques.

Functions. (1) To arrange demonstrations and lectures on specialised photographic techniques. An attempt should be made to build a strong link between medical and veterinary workers interested.

(2) To arrange showings of films of veterinary interest. Wherever possible international works should be viewed and copies of outstanding material purchased to build up a film library. The cost

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The Cook Committee Report

The first impression of the Interdepartmental Committee on Milk Composition in the United Kingdom, known as the Cook Committee, is very favourable as its recommendations are both constructive and realistic. The subject was examined most thoroughly from the medical, legal and animal husbandry aspects, and the work was facilitated by the Committee dividing itself into three panels. The greater part of the evidence considered is given in the reports of these panels.

The Committee found that over the years there has been a slight decline in both the solids-not-fat and the butterfat content of milk in England and Wales but there has been little change in Scotland. In the opinion of the Committee this decline could well continue unless positive steps are taken to arrest it.

In this era of improved health services and rising living standards the emphasis is rightly placed on the nutritional status of liquid milk. The medical evidence, although factually weak, confirms that from the standpoint of nutrition the value of milk lies in the protein, calcium and other nutrients provided by the S.N.F. fraction. As a result the Committee have recommended "that the efforts of the dairying industry in the years ahead should be directed towards maintaining and improving the S.N.F. content of the liquid milk supply." This provided the basis for all the other recommendations and the more important are:—

Milk should be sold as it comes from the cow except for separated and other special grades of milk.

For both legal and marketing purposes, the fat and S.N.F. contents should continue to be the criteria used.

Consideration should be given to the adoption within 10 years of a fixed minimum standard for whole milk of 8.5 per cent. S.N.F. and of 3 per cent. fat.

Abstraction of fat from milk intended for sale as whole milk should be a legal offence.

Differential payment schemes for S.N.F. should be introduced as soon as possible.

Penalties should be imposed in Great Britain at 8.4 per cent. S.N.F. and below; with gradations in price of sufficient magnitude to provide an effective deterrent to low S.N.F.

The Committee suggest that a standing advisory body be appointed to report on all aspects of milk composition and that, in England and Wales, the Joint Milk Control Committee be adapted to undertake the task. Similar committees should be appointed for Scotland and Northern Ireland.

Considering the complexity of the subject it is surprising that there are no minority reports. This unanimity may explain the lack of decisiveness of parts of the Report. For example, it should be possible to drop the outmoded presumptive standard at the outset and replace it with a minimum standard, which could be gradually increased over the 10-year period. Experience strongly indicates that marketing standards are the most potent means of effecting improvement, and the Committee's recommendations should be introduced as soon as possible.

The problem of the fat content has largely been avoided. This may have been due to the Committee being unable to obtain definite evidence on the relationship of milk fat to atheroma or coronary disease. Surely it would have been bolder to prepare a scheme including bonus payments or penalties for butterfat, which could have been implemented or withdrawn in the light of future medical evidence. The present bonus scheme for Channel Island cattle, which is based on breed and not fat per cent., is quite irrational.

A minimum of 3 per cent. fat is low by present standards and a higher figure, such as 3.3 per cent. the present marketing standard, would have been reasonable. However, since the fat and S.N.F. content of milk are broadly related, the proposed S.N.F. marketing standard of 8.5 per cent. is more than likely to be accompanied by an increase in average fat.

The Committee was very wise in suggesting a period of 10 years before the final standards are introduced and the subsequent penalties applied. If the job is to be done, a definite target must be set. There is no reason to believe that all herds will not be able to reach that standard in the time, provided the owners are prepared to make an effort.

Environmental and genetic factors largely account for the variations in the S.N.F. content of milk and each is credited in the Report with an influence of approximately 50 per cent. Nutrition is the most important management factor and low values arise from feeding insufficient nutritive food or from bulky foods, such as some hay or silage, of low food value. The other management factors are outlined and, although not so important, should be understood.

The genetic factors are indicated by the presence in the herd of individuals giving low S.N.F. values and by the differences between breeds. Although

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The Value of Photography to the Veterinary Profession. —*Concluded.*

should defrayed by hiring charges, the demand having been tested prior to purchase.

(3) To represent the profession's interests in photographic organisations.

(4) To organise and administer any exhibition or competition recommended to, or on the instructions of, the B.V.A.

(5) To make a survey of the photographic needs of the profession and to devise projects aimed at the production of such material.

(6) To provide a photographic advisory service for members of the profession wishing to interest themselves in photography and later to provide a quarterly newsletter for its members.

Current Literature

BOOK REVIEW

Brucella Infection and Undulant Fever in Man. Sir Weldon Dalrymple-Champneys, Bt., C.B., D.M., D.Ph., F.R.C.P. London. Oxford University Press (1960). 25s.

Sir Weldon Dalrymple-Champneys has a wealth of experience of *Brucella* infection in man; his book gives a comprehensive account of this experience together with a description of the work of others in this particular field, gathered over a period of nearly thirty years. Although the term brucellosis is a convenient single word for *Brucella* infection it does not appear to be favoured by the author which may be regretted by some.

This monograph is a valuable addition to the medical literature and should be read by every veterinary surgeon interested in the nature, control, and future eradication, of brucellosis; it is well laid out in clear cut sections, easy to read, and full of interesting information. Although some recent advances, such as phage typing of *Brucella* are mentioned (but not in the index), perhaps a further plea could have been made for the standardisation of cultural methods in medical and veterinary laboratories. For example, the use of liver agar is still prevalent at some laboratories whereas "Albimi" agar, which has the advantage of being a standard product, is employed at others. Moreover, different antigens for agglutination tests are used at veterinary and medical laboratories which makes it difficult to compare the results of serological tests in animals and man. In recent years, various antibiotics have made it possible to evolve selective media which permit the growth of *Brucella* from contaminated material when it might otherwise be missed; such information is perhaps worthy of mention even if no precise details are given. When the author discusses aberrant and atypical strains, it is perhaps surprising that he does not mention S.19 as a good example of an avirulent strain in which the character of reduced virulence appears to be stable even after passage through pregnant cows. The author states that the disease is restricted to cattle and horses in Britain; on the contrary, *Brucella* infection has been recorded in sheep in Britain and the organism has also been recovered from a free living wild rat. Moreover, serological evidence favours the view that brucellosis may occur in wild deer. A search has still to be made in other species and the goat population, in particular, has not yet been extensively examined for infection.

Attention is drawn to the risk of transmission of the disease by blood transfusion. This is probably justified because, in a recent survey of sera from

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The Cook Committee Report.—*Concluded.*

there has been a tendency for a decline in fat and S.N.F. percentage in all breeds, nationally the change in breed structure towards the Friesian at the expense of the Dairy Shorthorn is the most important.

Artificial Insemination is recognised by the Committee as the means of obtaining relatively rapid herd improvement and there is no doubt that when sufficient bulls, proven for high S.N.F. in their daughters, or with high S.N.F. values in their ancestry can be found, sufficient genetic improvement should be achieved. Here there is a doubt, but a less prominent suggestion of the Committee, namely the crossing of low S.N.F. animals with a breed of high S.N.F. character, will give a quick and reliable result. This is not in keeping with the Ministry's policy or with the objects of all breed societies, who desire to maintain the pure breed structure of herds. The ironical point is that the A.I. service, which facilitated the rapid swing towards Friesian type, could now operate in the opposite direction. Whatever the outcome, the implications of this Report will lead to a further advance in the use of A.I.

The official milk recording movements, in the Committee's view, should provide facilities for testing and recording the milk of individual animals for S.N.F. content as well as for fat; and official recording should be financially assisted until S.N.F. recording becomes accepted practice. This vital part of the programme could provide an indirect stimulus to the national milk recording movement, which would be very desirable.

The approach, then, to a problem herd is advisory and should begin by considering if mastitis, the only disease involved in low S.N.F., is interfering with the milk composition and this should be followed by an investigation of the nutrition and herd management aspects. If no solution is found, the problem may be assumed to be of genetic origin and would result in the culling of low S.N.F. animals, the introduction of other breeds or a policy of cross breeding. New herd-owners may be tempted to go into breeds of cattle characteristic for high S.N.F. content in their milk.

Should the Committee's recommendations be accepted, much detailed planning will be essential and not least in the provision of S.N.F. testing services.

The Committee should be congratulated in going into the subject so thoroughly and considering the question of solids other than fat from the interests of the consumer. No Committee report will suit all parties and there is no doubt that this one will have its critics. The Committee has outlined a broad policy, which, if the industry tackles its problem seriously and in the right spirit, will be found to be both practicable and capable of implementation within the time set.

Everyone interested in the future of the dairy industry, and who might be called on to advise on S.N.F. problems, should read and become familiar with the Cook Report.

blood donors in the south of England, at least one individual showed a very high titre suggestive of active infection with the possibility of a bacteraemia. Routine bacteriological examination of donor blood would be ideal if practicable and serological tests could be used for screening purposes. Lack of notification, as the author says, has been a stumbling block to further acquisition of information concerning the epidemiology of the disease in animals and in man and if introduced would help considerably to link up medical and veterinary investigations.

From the veterinary point of view while condoning the term "comfortable symbiosis" in the description of treatment of human cases, we can hardly adopt this attitude with regard to cattle, since our aim is to control the disease by suitable immunisation methods until the infection is reduced to a minimal level and then at an appropriate time, to consider the possibility of eradication.

After reading this book with its lucid description of numerous human cases, the miseries inflicted on the victims, the danger of ingesting infected non-pasteurised T.T. milk, and the risks involved in handling infected animals, we cannot, as veterinarians, remain in any doubt as to our future attitude towards this disease—the human population must be protected from brucellosis. This can never be achieved simply by pasteurisation of the milk supply —elimination of the animal reservoirs of infection is the only answer.

In the meantime, if this books helps to focus attention on a long neglected public health problem and stimulates still further interest in veterinary and medical circles about brucellosis, the years of work, which it so adequately describes, will have been fully justified.

BOOKS RECEIVED

Fundamental Aspects of Normal and Malignant Growth, by W. W. Nowinski. Elsevier, Amsterdam (1960). 220s. Available from D. van Norstrand Company Ltd., 358, Kensington High Street, London, W.14.

The Dog Business, by Douglas Appleton. Popular Dogs, London (1960). 21s.

The Blood Chemistry of the Dog and Cat, by Frank Bloom. Gamma Publications, New York (1960). $4.75.

British Poultry Standards. Poultry World, London (1960). 35s.

Glands of Internal Secretion in the Embryonic Development of Birds and Mammals, by M. S. Mitskevich. The Academy of Sciences of the U.S.S.R., Moscow (1957). Translation from the Program for Scientific Translations, 14, Shammai Street, P.O. Box 7145, Jerusalem, Israel.

Diet in Relation to Reproduction and the Viability of the Young. Part III—Pigs, by D. L. Duncan and G. A. Lodge. Commonwealth Agricultural Bureaux, London (1960). 20s.

An Introduction to the Biology of Micro-organisms, by Lilian E. Hawker, A. H. Linton, B. F. Folkes, and M. J. Carlile. Edward Arnold, London (1960). 35s.

British Pharmacopoeia: Addendum, 1960. The Pharmaceutical Press, London (1960). 30s. (Published October 3rd).

Comparative Biochemistry and Physiology. Volume I, No. 1. January, 1960. Pergamon Press.

The Biochemistry of Development, by Jean Brachet. Pergamon Press, London (1960). 65s.

The Problem of Acute Hypothermia. P. M. Starkov (ed.) Pergamon Press. London (1960). 70s.

The Kybernetics of Natural Systems, by D. and K. Stanley-Jones. Pergamon Press, London (1960). 42s.

Implications of Evolution, by G. A. Kerkut. Pergamon Press, London (1960). 30s.

Ten Little Housemates, by K. von Frisch. Pergamon Press, London (1960). 17s. 6d.

News and Comment

TRICHINOSIS AND BRITISH PIGS

We are indebted to Mr. D. J. Anthony for the following note:—

In British slaughterhouses where the inspection of meat is under veterinary control, some inspection of pork muscle for *Trichinella spiralis* is often carried out, but the parasite seems to be absent from pigs bred in this country. The last series of human infection with *Trichinella* took place in the Wolverhampton district during the Second World War, but was not traced to pigs bred in Britain.

A Continental breed of pigs has not only been imported into this country since those days, but the breed is now a "recognised" British one. In view of this a special examination for *T. spiralis* in pigs slaughtered in a large meat factory, and covering 10,000 animals, was recently carried out. The pigs came mainly from British centres with a few from Northern Ireland. In addition, about 100 imported Danish pork carcases were examined. No trace of the parasite was seen, and this seems to indicate that there is some truth in the contention that trichinosis is not found in British pig breeds. Nevertheless, inspection for the parasite should be carried out in every slaughterhouse, and although facilities for the 10 per cent. inspection carried out in some Continental slaughterhouses are not provided by our Local Authorities, there is no reason why a veterinary meat inspector should not undertake some daily inspections for *Trichinella* himself. A negative result is often more valuable than a positive one.

THE JOINT MEASUREMENT SCHEME

At the Dorchester Agricultural Show on September 1st, an objection on grounds of height was lodged against the small Hunter, "Eamon Finn," belonging to Miss M. C. Vaughan, which holds an annual height certificate under the Rules of the Joint Measurement Scheme. In accordance with these Rules, the animal was re-measured by 2 referees and the height was found to be 15.1⅞ without shoes. The objection was, therefore, overruled.

XUM

AFRICAN HORSE SICKNESS BAN

The importation of horses, asses and mules which have passed through or come from Africa, Cyprus, and a group of Asian countries has been prohibited from September 27th. This is the effect of the Importation of Horses, Asses and Mules (African Horse Sickness) (Prohibition) Order, 1960, made by the Minister of Agriculture and the Secretary of State for Scotland. The ban effects Africa, Afghanistan, Cyprus, India, Israel, Iraq, Iran, Jordan, the Lebanon, Pakistan, Saudi Arabia, Turkey, United Arab Republic and the U.S.S.R.

Although the total number of horses imported from the countries affected by the present epidemic of African horse sickness rarely reaches double figures in any one year, no avoidable risk can be taken of the disease reaching Great Britain. It is endemic in parts of Africa, and since October, 1959, has spread to a number of near and middle eastern countries.

There is already legislation in force which requires horses, asses and mules imported into Great Britain (except from Northern Ireland, the Republic of Ireland, the Channel Islands and the Isle of Man) to be accompanied by various certificates of health given by the State veterinary surgeons of the exporting country. As an additional safeguard (where imports are still permitted), these certificates will now be required specifically to state that the horses referred to showed no symptoms of African horse sickness, and have not been exposed to the risk of infection.

STANDING COMMITTEES OF THE B.V.A.

At its meeting on September 3rd, in Glasgow, Council approved the recommendation of its Nominations Committee that the following ladies and gentlemen be elected to Standing Committees.

Lists had been circulated to the Nominations Committee showing the attendances of members during the year 1959/60 and also the names of members recommended by Divisions to serve on particular committees. Officers of the B.V.A. are *ex-officio* members of all committees.

GENERAL PURPOSES AND FINANCE COMMITTEE
20 Members plus Past-Presidents and Chairmen of other Standing Committees

Anderson, K. P.; Atkinson, G.; Black, N. M.; Brancker, Miss W. M.; Bywater, H. E.; Cotchin, E.; Freak, Miss M. J.; Hardwick, E. F.; John, F. V.; Moss, J. A.; Oliver, D. F.; Piercy, S. E.; Pugh, P. D. S.; Sellers, K.; Steele-Bodger, A.; Towers, K. G.; Tullis, G.; Tweed, W.; Uvarov, Miss O.; White, J. B.

Reserves: Woodrow, C. E.; Howell, D. G.; Luke, D.; Dall, J. A.; Pasfield, J. A.; Dixon, A. C.; Sutherland, A.

FARM LIVESTOCK COMMITTEE
20 Members

Bell, R. L.; Brown, A. C. L.; Brown, G. F.; Chambers, F.; Chapman, A. S.; Golledge, L. St. Bel.; Heath, G. B. S.; Heather, E. J.; Hector, A.; Howell, D. G.; John, F. V.; Loxam, J. G.; McGhee, J. H.; Muir, R.; Pettett, D. W. S.; Searles, G. W.; Stewart, D. L.; Wilkinson, E.; Wright, A. J.; Wylie, R. L.

Reserves: Robson, W. J. B.; Wyse, G.; Lucas, J. M. S.

VETERINARY STATE MEDICINE COMMITTEE
20 Members

Atkinson, G.; Beattie, I. S.; Bywater, H. E.; Callender, E. R.; Chapman, A. S.; Conn, E.; Curtis, P. E.; Edwards, J. B.; Hardwick, E. F.; McGrath, R. E.; Male, N. P.; Mitchell, P. J.; Nicholson, D. S. S.; Osborne, A. D.; O'Sullivan, K.; Perkins, L. E.; Sutherland, A.; Tweed, W.; Wilkinson, E.; Wyse, G.

Reserves: Powley, G. S.; Wood, S. W.; Jenkins, E.

TECHNICAL DEVELOPMENT COMMITTEE
26 Members (with power to co-opt)

Anderson, K. P.; Beaumont, G. L.; Blackburn, P. S.; Bowden, R. F. S.; Brancker, Miss W. M.; Bruford, J. W.; Dall, J. A.; Field, H.; Gould, G. N.; Ingram, J. M.; Inglis, J. S. S.; King, J. O. L.; Loosmore, R. M.; McIntyre, W. I. M.; Montgomerie, R. F.; Moss, J. A.; Oliver, D. F.; Pittaway, E. M.; Robertson, A.; Rowlands, W. T.; Sellers, K. C.; Taylor, E. L.; Towers, K. G.; White, J. B.; Wilson, A. L.; Wooldridge, W. R.

Reserves: Luke, D.; Crowhurst, F. A.; Pearson, J. K. L.

HOME APPOINTMENTS COMMITTEE
20 Members

Appleby, E. C.; Clabby, J.; Davies, G. O.; Dudlyke, R.; Edwardson, J.; Gordon, F. A.; Graham, A. M.; Jordan, F. T. W.; Llewellyn, D. G.; Luke, D.; McGhee, J. H.; Moss, J. A.; O'Sullivan, K.; Pettett, D. W. S.; Rowlands, W. T.; Singleton, A.; Steele-Bodger, A.; Sutherland, A.; Taylor, A. M.; Tullis, G.

Reserves: Beeson, A. J.; Mann, T. Barton.

SMALL ANIMALS COMMITTEE
20 Members

Adams, A. J.; Alexander, F.; Brown, G. F.; Bushman, G. N.; Bywater, H. E. (*ex-officio*); Campbell, R. S. F.; Carr, W. H.; Dalby, Miss M.; Evans, K. G. D.; Freak, Miss M. J.; Hall, I. S.; Hodgman, S. F. J.; John, F. V.; Jones, B. V.; Laugier, G. V.; Lewis, D. G.; Oliver, D. F.; Oliver, G. M. G.; Pittaway, E. M.; Thomson, A.; Woodrow, C. E.

Reserves: Buckler, G. K.; Holroyd, H.; Adams, J. A.

PARLIAMENTARY AND PUBLIC RELATIONS COMMITTEE
20 Members

Black, N. M.; Callender, E. R.; Edwards, J. B.; Forster, J.; Green, D. A.; Hall-Patch, P. K.; Henderson, G. N.; Hughes, D. L.; Johnston, J. B.; Jones, O. Graham; Kelly, Mrs. K. G. R.; Lewis, E. F.; Massey, R.; Pasfield, J.; Perkins, L. E.; Sutton, E. G.; Thomson, A.; Uvarov, Miss O.; Wooldridge, W. R.; Stuckey, Mrs. G. M.

Reserves: Manton, V. J. A.; George, I. G.; Parsons, J. H.

OVERSEAS COMMITTEE
15 Members

Beaton, W. G.; Beaumont, E.; Carmichael, J.; Chalmers, A. W.; Cronly, H.; Fisher, R. C. U.; Lancaster, W. E.; McCulloch, J.; Marshall, R. S.; Phillips, R. N.; Piercy, S. E.; Pool, W. A.; Smith, D. F. G.; Ware, Sir Frank; Wright, R. A.

EDITORIAL COMMITTEE
6 Members

Freak, Miss M. J.; Harbour, H. E.; Ingram, J. M.; Jarrett, W. F. H.; Joshua, Miss J. O.; Pattison, I. H.

Reserve: Alexander, F.

Note. It was recommended that this Committee be empowered to co-opt, and that the committee should consider whether the scientific editor of Research in Veterinary Science should be, *ex-officio*, a member.

UNIVERSITY NEWS

Bristol

Second Examination for the degree of B.V.Sc.

Pass. Bowerman, H. R. L.; Davies, K. A.; King, N.; Nurse, R. G.

Third Examination for the degree of B.V.Sc.

Pass. Brodrick, T. W.; Dando, Miss G. G.; Gibbs, Miss C.; Gill, G. P.; Herbert, M. D.; Higham, D. A.; Trowbridge, D. A.

Liverpool

ORDINARY DEGREE OF B.V.SC.

Davies, J. O.; Fitton, M. W.; and Zanetti, P. J.

DEGREE OF B.V.SC., FIRST EXAMINATION

Part I (Chemistry)

Dolan, M. S.

Part II (Physics)

Bairds, J. M.; Davies, J. A.; Evans, G. R. E.; and Terry, J. E.

Part III (Botany)

Bairds, J. M.

Part IV (Zoology)

Fasawe, T. C. K.; Parsons, G. A. T.; and Wiggett, I.

Edinburgh

The undermentioned candidates have passed in the subject of Physics of the First Professional Examination for the degree of Bachelor of Veterinary Medicine and Surgery:—

Arije, Gabriel F.; Baird, Ernest J.; Baxendale, William; Blackhall, Kenneth M.; Brechin, Robert; Cameron, James S.; Chavunduka, Dexter M.; Cowburn, Anthony C.; Dobson, Michael C.; Frerichs, Graham, N.; Hally, John; Lamont, William N.; Lumsden, Malvern M.; McLennan, Derek W.; Paton, Iain M. S.; Walker, Ronald; White, James N.; Wood, Jean L.; Woods, Joseph A; and Wrather, Peter A.

The undermentioned candidates have passed in the subject of Chemistry of the First Professional Examination for the B.V.M. & S. degree:—

Brown, Morag E.; Cameron, James S.; Cowgill, Michael G.; Frerichs, Graham N.; Galloway, Fiona H.; Knox, Samuel A.; Lumsden, Malvern M.; Millar, Eric H.; Paton, Iain M. S.; Poulsom, Michael J.; Ross, Harry M.; Shanks, Allan L.; Shevill, John R.; Slessor, Margaret B.; and Taylor, Andrew S.

The undermentioned candidates have passed in the subject of Biology of the First Professional Examination for the B.V.M. & S. degree:—

Agyekumhene, John K.; Baxendale, William; Crosbie, Andrew P.; Frerichs, Graham N.; Knox, Samuel A.; Millar, Eric H.; Mogford, Alan M. H.; Ross, Harry M.; Shevill, John R.; and Slessor, Margaret B.

The undermentioned *External* candidate has passed in the subject of Physics of the First Professional Examination for the B.V.M. & S. degree:—

Conchie, Allan J.

The undermentioned *External* candidate has passed in the subject of Chemistry of the First Professional Examination for the B.V.M. & S. degree:—

Kennedy, Judith.

The undermentioned *External* candidate has passed in the subject of Biology of the First Professional Examination for the B.V.M. & S. degree:—

Drake, Anthony F.

The undermentioned candidates have passed in the subject of Veterinary Preventive and State Medicine of the Final Professional Examination (Part II) for the B.V.M. & S. degree:—

Duncan, Walter D.; Jobling, Terence; and Wood, Hamish.

B.V.A. COMMITTEE AND COUNCIL MEETINGS

Tuesday, November 15th, at 7, Mansfield Street

5 p.m. Finance Sub-Committee.

Wednesday, November 16th, at 7, Mansfield Street

10.30 a.m. Small Animals Committee.

12 noon Parliamentary and Public Relations Committee.

2.15 p.m. Veterinary State Medicine Committee.

4 p.m. Home Appointments Committee.

Thursday, November 17th, at 7, Mansfield Street

10.30 a.m. Farm Livestock Committee.

2.15 p.m. General Purposes and Finance Committee.

Friday, November 18th

10.15 a.m. Council Meeting in the Connaught Rooms, Great Queen Street, London, W.C.2.

THE COLONIAL VETERINARY SERVICE

New appointment. S. D. Wilkie, M.R.C.V.S., Veterinary College of Ireland, Dublin, becomes Veterinary Officer, British Honduras.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

BAMBRIDGE, William John, Cornerways, Eddington, Hungerford, Berks., Captain late R.A.V.C. (S.R.). Graduated December 18th, 1914, at the Royal (Dick) Veterinary College, Edinburgh. Died September 20th, 1960, aged 72 years.

PERSONAL

Col. J. Hickman of the Department of Veterinary Clinical Studies in the Cambridge School has just left on a month's tour of Russia and Poland to visit some of their veterinary schools.

Mr. A. J. Stevens left this country on September 21st to undertake a one-year assignment for FAO. The assignment is officially to advise the Government of the Egyptian region of the United Arab Republic on the organisation of provincial veterinary laboratories; to initiate a system for the submission of pathological material for diagnosis; to visit veterinary centres in different parts of the region; to survey the livestock disease position; and to train veterinarians in laboratory diagnostic techniques.

Births

BICKNELL.—On September 7th, 1960, at Cranfield, Damers Road, Dorchester, to Connie and Ray Bicknell, a son, Stephen Ronald, brother for Leslie.

BOLTON.—On September 22nd, 1960, at Greenbank Maternity Home, to Elizabeth (*née* Nish), wife of Frederick Noel Bolton, B.V.M.S., M.R.C.V.S., of 131, Shafto Way, Newton Aycliffe, County Durham, a son.

SEAMER.—On September 20th, 1960, in Albany, New York, U.S.A., to Shirley, wife of John Seamer, M.A., B.SC., M.R.C.V.S., D.V.S.M., a son.

XUM

Marriage

DEVILE—COOMES.—On Saturday, September 17th, 1960, at St. Peter's Church, Langham Gardens, Grange Park, N.21, C. Paul DeVile, B.VET.MED., M.R.C.V.S., to Cynthia Mary Coomes of Grange Park, N.21.

Engagements

HOLMES—DORR.—The engagement is announced between John Anthony Russell Holmes, B.V.SC., M.R.C.V.S., only son of Mr. and Mrs. H. R. Holmes of Northampton, and Denise Maureen Dorr, youngest daughter of Mr. and Mrs. W. F. C. George of The Ivies, Wilby, Wellingborough.

MUNRO—WYNN.—The engagement is announced between David Munro, B.V.M.S., M.R.C.V.S., second son of Mr. and Mrs. William Munro, of Sunderland, and Penelope Marjorie Wynn, elder daughter of Mrs. H. M. Wynn of Horseley, Northumberland, and the late Group Captain W. E. Wynn, O.B.E.

Correction

The Animal Health Trust ask us to state that in their details of Educational Awards the first Wellcome Fellowship, given to R. B. Taylor, should have ended with the word "Edinburgh" rather than "Cambridge."

COMING EVENTS

October

5th (Wed.). R.A.V.C. DIVISION. Meeting at the Equine Research Station, Balaton Lodge, Newmarket, 11 a.m.

SCOTTISH METROPOLITAN DIVISION. Autumn Meeting in the Royal (Dick) School of Veterinary Studies, Edinburgh, 2.45 p.m.

6th (Thurs.). TECHNICAL DEVELOPMENT COMMITTEE. Meeting at 7, Mansfield Street, Portland Place, London, W.1, 10.30 a.m.

LANCASHIRE VETERINARY ASSOCIATION. General Meeting and Dinner at the Exchange Hotel, Liverpool, 6 p.m.

CENTRAL VETERINARY SOCIETY. Meeting at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

7th (Fri.). NORTH OF IRELAND VETERINARY ASSOCIATION. Autumn Meeting at the Midland Hotel, Belfast, 3 p.m.

12th (Wed.). MIDLAND COUNTIES VETERINARY ASSOCIATION AND SOUTH EAST MIDLANDS VETERINARY ASSOCIATION. Dinner-Dance at the Hotel Leofric, Coventry, 8 p.m.

CORNWALL VETERINARY CLINICAL CLUB. Meeting at the Royal Hotel, Bodmin, 7.30 p.m.

13th (Thurs.). YORKSHIRE VETERINARY SOCIETY. Annual Dinner-Dance at the Cairn Hotel, Harrogate, 8 p.m.

15th (Sat.). B.S.A.V.A. NORTH WEST REGION. Meeting at the Bull and Royal Hotel, Preston, 8 p.m.

18th (Tues.). MID-WEST VETERINARY ASSOCIATION. Dinner-Dance at the Berkeley Café, Clifton, Bristol.

19th (Wed.). SUSSEX VETERINARY SOCIETY. Meeting at the Dudley Hotel, Lansdowne Place, Hove, 2.30 p.m.

SOUTH EASTERN VETERINARY ASSOCIATION. Meeting at the Royal Star Hotel, Maidstone, 2.30 p.m.

21st (Fri.). SCOTTISH METROPOLITAN DIVISION. Annual Dinner-Dance at the Carlton Hotel, North Bridge, Edinburgh, 8 p.m.

26th (Wed.). WELSH BRANCH. Meeting at the Belle Vue Hotel, Aberystwyth, 2.15 p.m.

27th (Thurs.). SOCIETY FOR THE STUDY OF ANIMAL BREEDING. Meeting at 1, Wimpole Street, London, W.1, 11.30

28th (Fri.). SOU[illegible]ALES DIVISION. Annual Dinner-Dance at the [illegible] Hotel, Cardiff, 8 p.m.

YORKSHIRE VET[illegible]NARY SOCIETY. Meeting at the Royal Station Hotel, York, 2.30 p.m.

November

11th (Fri.). V.V.B.F. NORTH OF SCOTLAND DIVISION. Annual Dinner-Dance in the Northern Hotel, Aberdeen, 7.30 p.m.

December

2nd (Fri.). NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION. Annual Dinner-Dance at the White Swan Hotel, Alnwick.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Ches. Home Farm, Ince, Chester (Sept. 20).
Lancs. Church End Farm, Hale, Liverpool (Sept. 21).
Renfrews. Whitemoss Farm, Bishopton (Sept. 20).
Stirling. Cushenguarter Farm, Plesn (Sept. 23).

Swine Fever

Bucks. Upper Bottom Farm, Chalfont St. Giles (Sept. 22).
Ches. Bower End Farm, Madeley, Crewe (Sept. 22); Manor Farm, Bickley, Malpas (Sept. 26).
Devon. 15, St. Annes Road, Babbacombe, Torquay (Sept. 20).
Dorset. Coombe Farm, Coombe, Sherborne (Sept. 26).
Durham. Chapmans Allotments, The Green, Helsden, West Hartlepool (Sept. 20).
Flints. Cae March, Sychtyn, Mold (Sept. 26).
Hereford. The Croft, Bromsberrow Heath, Ledbury (Sept. 22).
Lancs. New Pye Hill, Downholland, Ormskirk (Sept. 22).
Lincs. Piggeries at High Street, Eactoft, Scunthorpe (Sept. 20).
Montgomery. Llwynybrain, Aberhafesp, Newtown (Sept. 20); Tymawr, Llanfechain (Sept. 21).
Somerset. Piggeries, Lusty Bridge, Bruton (Sept. 26).
Staffs. Piggeries off Ashworth Street, Fenton, Stoke-on-Trent (Sept. 26).
Suffolk. Elm Farm, and Eight Elms Farm, Condock, Ipswich (Sept. 20); Hill Farm, Toft Monks, Beccles; Fullers Farm, Toft Monks, Beccles (Sept. 22); Hillcrest, Hemingstone, Ipswich (Sept. 23); Bulmer Orchards, Hedingham Road, Bulmer, Sudbury (Sept. 26).
Surrey. Bonsey Farm, Horsell, Woking (Sept. 26).
Sussex. Little River Nursery, River, Petworth (Sept. 23).
Warwicks. The Piggeries, Hawkes Farm Cottages, Heathcote Lane (Sept. 20).
Worcs. Freemans Place, Berrington, Tenbury Wells (Sept. 22).
Yorks. The Cottage Piggeries, Little Fenton, Tadcaster (Sept. 21); Grange Farm, Little Fenton, Tadcaster (Sept. 22).

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

" Spontaneous Diabetes Mellitus "

Sir,—I regret that Mr. Pitcher has taken exception to the use of this term. It is, however, necessary to distinguish between the naturally occurring disease, to which my paper was confined, and the slightly different experimental condition.

Yours faithfully,
J. S. WILKINSON.

Royal Veterinary College,
Royal College Street,
Camden Town,
London, N.W.1.
September 21st, 1960.

Histamine and Saline Therapy

Sir,—I was glad to read the letter by Captain W. W. Lang addressed to you in THE VETERINARY RECORD of September 17th. It is of great interest and importance to hear from one of the more senior members of our profession about his introduction of the use of saline as a veterinary therapeutic measure. I entirely sympathise that it must be most troublesome to Captain Lang to be unable to explain the results which follow saline therapy, but it is certainly not the case that salt *per se* has any antihistaminic action. Indeed histamine can be, and often is, artificially dissolved in saline and there is no diminution whatever in the activity of that compound as a result.

The question of the dissolution of thrombi is also open to some doubt as to the *modus operandi*. Thrombi, by definition, invariably contain fibrin and this protein is not soluble in weak solutions of salt or sodium citrate. It may well be that saline therapy may, by osmotic effects, produce very temporary changes in the fluid balance of tissues including those subject to pathological change. But it is worthy of emphasis that saline, with or without added citrate, cannot of itself either antagonise histamine or produce lysis of thrombi.

Yours faithfully,
R. K. ARCHER.

Equine Research Station,
The Animal Health Trust,
Newmarket, Suffolk.
September 21st, 1960.

Canine Intraocular Surgery

Sir,—I should be glad if you would allow me to reply to the letter from Mr. Lloyd whose interest in my paper on intraocular surgery I appreciate. The following answers to the points raised by Mr. Lloyd, will, I hope, be helpful.

The dog's iris is a very vascular structure. In my experience, no matter what precautions are taken, iridectomy by excision or even cautery, is very rarely possible without immediate or delayed haemorrhage. Peripheral, and certainly complete iridectomy, invites sufficient haemorrhage to ruin the prospects of successful lens extraction. Of more importance is the evidence that iridectomy will neither prevent nor relieve ocular hypertension in dogs and I can do no better than refer Mr. Lloyd to *Veterinary Ophthalmology*, 2nd edition, R. H. Smythe, wherein the important absence of the scleral ring in small animals and the related lack of value of iridectomy is well surveyed.

Both eserine and pilocarpine in my experience have little myotic or ocular hypotensive effect in dogs. Diamox, even in conjunction with Dyflos B.P.C., although so effective in man, is disappointing in dogs except perhaps in the rare event of ocular hypertension being presented in its earliest stages.

I am very uncertain as to the point Mr. Lloyd wishes to make in the remainder of the paragraph following the reference to Diamox. In my paper, under the heading Anaesthesia, I have referred to postural hypotension and to hypotension as the best means of reducing haemorrhage to a minimum. This I confirm. These terms postural hypotension and hypotension relate of course to blood pressure, not intraocular pressure.

I am unable to connect any of the operation failures with suturing through the cornea as my technique is to avoid taking in the full thickness. In no case has difficulty arisen from the extrusion of buried sutures through the conjunctival flap.

Prior to the use of the flap method, corneal section alone was made. Castroviejo spring scissors (circular graft type) have been found most suitable.

I suggest that, unless he has already done so, Mr. Lloyd might be interested to look through a paper of mine, reference *Vet. Rec.* (1957), **69,** 318.

Yours faithfully,
GORDON C. KNIGHT.

Royal Veterinary College,
Beaumont Animals' Hospital,
Royal College Street,
London, N.W.1.
September 28th, 1960.

Vandals and a Veterinarian

Sir,—On page 710 of THE VETERINARY RECORD, August 27th, 1960, there is a reference, ". . . Provand's Lordship, a delightful manse dating from 1471 . . ."

It might be of interest to note that one of the four men responsible for saving this historic building from being demolished in 1906 was a veterinary surgeon, my father, the late Professor James Murphy, M.R.C.V.S., of the Glasgow Veterinary College.

Yours faithfully,
" Hayfield," C. T. MURPHY.
13, The Garstons,
Great Bookham, Surrey.
September 24th, 1960.

Simultaneous Presentation of Twin Lambs

Sir,—I would like to thank Messrs. T. Hughes Ellis and Alexander Whitelaw for their useful comments on my letter on the above subject in the THE VETERINARY RECORD of July 30th. I am particularly

grateful to Mr. Whitelaw for his reassurance concerning the value of epidural anaesthesia in the ewe. It seemed to me, after reading the letter by G. A. Oakley (*Vet. Rec.* **70**. 961) that by using epidural anaesthesia one might be adding about 10 per cent. to potentially fatal hazards in ovine dystocia, and I feared to try the method; now, after reading Mr. Alexander's letter, I shall certainly practise it.

Both Messrs. Ellis and Alexander question on logical grounds my assumption that Australia on the whole may not be economically ready for the general use of the caesarean operation in ovine obstetrics. One could, of course, be mistaken. There may be some other reason why no breeder of sheep here has ever suggested to me that a caesarean operation might be preferable to my methods for his ewe. Our Tasmanian breeders mix with Australian mainland sheep-men and one would think that if the operation appealed to the common sense of Australian breeders generally, some approach would have been made to me to change my methods. Your correspondents and I lack a common ground of agreed data on which to judge the matter fairly. For instance, I do not know what fee is usually charged in Britain for a caesarean operation on the ewe, what average percentage of recoveries is obtained, or what effect, if any, the operation has on subsequent fertility. On the other hand you, in Britain, may not all know that the market value of sheep here now—making allowance for the rate of exchange—is at times little more than one third of market prices in Britain. Yet another reason against the caesarean is that in most instances, before consulting me, the owner "has a go" himself making the case a bad risk.

In the 4 cases described in my letter in THE VETERINARY RECORD of July 16th only case No. 4 would have been suitable for caesarean operation and I managed quite well without it. The other 3 ewes had been made probably non-viable before seen by me.

Other data we do not have is the time taken for our operations. Without having kept accurate records I would estimate my average time for delivering by embryotomy at 30 minutes, but do not know the average time taken for a caesarean operation in Britain, including asepsis. Results also have an economic aspect. With fresh cases I expect a recovery rate of at least 80 per cent. Recently a local breeder of Dorset Horn sheep reminded me that in the last 3 seasons all of his 12 ewes lambed by my method had recovered. He happens to be one of the few breeders who leave the ewe entirely alone for me when he sees the case is beyond him. Sad experience tells me that I could not possibly have done as well as this with caesarean operations, perhaps owing to personal ineptitude. But, as stressed in earlier contributions to THE VETERINARY RECORD such success depends entirely on having a small hand which is the main reason why I think my method is economic—for me.

Experience has made it possible greatly to shorten the time taken for correction of dystocia by embryotomy. When one began this work there was no chartered surgical course to follow: one had to proceed by trial and error and this was a time-consuming business; when the lamb was dead and wholly within the body of the uterus, one was uncertain whether to start on the head or the forelegs, in a fore- or semi-fore presentation. We all know, in the case of a live lamb still within the uterus, it is usually advisable to begin with the head, and at first I felt impelled to do this with a dead lamb. But this is generally wrong and it took me long to find it out. The right thing to do with the dead lamb, as a rule, is to start by getting out and removing both forelegs by subcutaneous skinning.

There are 2 sound and sufficient reasons for this procedure: it is usually much the easiest for both operator and ewe, and subsequent delivery by traction on the head greatly facilitates matters for the ewe owing to reduction of the circumference of the foetus when both shoulders are removed.

Indeed, in cases where a dead lamb is swollen by emphysema, or the pelvic canal is narrowed by tissue-changes removal of the foetal shoulders may make the difference between survival and death.

Benesch, in *Embryotomy of the Calf*, advises beginning the subcutaneous skinning of the foreleg below the knee. But in the lamb it is much better and quicker to enter the skin above the knee if possible. With practice one can remove both forelegs in a few minutes, after which the residue of the foetus can be got out in a few more minutes in uncomplicated cases if full use is made of the vulsellum forceps to grip and pull the head into, and through, the narrow pelvic canal.

I have discarded the single-pronged forceps in favour of a double-pronged 18-inch Hauptner instrument and find it much more serviceable.

The technique is to thrust one jaw of the forceps into the mouth of the dead lamb as far as it will go and then to close the instrument as far up the nose as possible. This gives great and safe power of traction.

My object in obstetrical work has been to gain enough clinical experience to be able to help, and even perhaps educate our farmers, while doing a little to alleviate the often grim plight of the parturient ewe in Tasmania.

To avoid further misunderstanding—evident in the letter of Mr. Ellis—about the peculiar differences between conditions in Britain and in Tasmania in this matter, I would emphasise once more what was indicated in my former letter: that is, the remarkable ability of many of our Tasmanian stud sheep breeders to correct dystocias by the simple means described by Mr. Ellis. Thus, if a dystocia can be corrected simply by holding up the hind quarters of the ewe and pulling out the head of the foetus, either by a finger and thumb grip on the eye sockets or by placing a loop of baling wire or plastic behind the poll, the breeder here does not often trouble a veterinary surgeon, he does the job himself. With few exceptions the dystocias submitted to me are those that can only be saved by special surgery or, at best, by practised manipulation with a hand smaller than that of any Tasmanian farmer.

Yours faithfully,

J. W. RAINEY.

P.O. Box 67,
Westbury, Tasmania.

September 16th, 1960.